CIGWELD

AN ESAB BRAND

100+ YEARS OF WELDING INNOVATION

BLUE VENOM

XF210⁶

OPERATING MANUAL

CIGWELD
AN ESAB BRAND

WE APPRECIATE YOUR BUSINESS!

Congratulations on your new CIGWELD product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network.

This Operating Manual has been designed to instruct you on the correct use and operation of your CIGWELD product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

We have made every effort to provide you with accurate instructions, drawings, and photographs of the product(s) while writing this manual. However errors do occur and we apologise if there are any contained in this manual.

Due to our constant effort to bring you the best products, we may make an improvement that does not get reflected in the manual. If you are ever in doubt about what you see or read in this manual with the product you received, then check for a newer version of the manual on our website or contact our customer support for assistance.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

CIGWELD is a Market Leading Brand of Arc Welding Products for ESAB. We are a mainline supplier to major welding industry sectors in the Asia Pacific and emerging global markets including; Manufacturing, Construction, Mining, Automotive, Engineering, Rural and DIY.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to develop technologically advanced products to achieve a safer working environment for industry operators.

100+ YEARS OF WELDING INNOVATION

WARNING

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment. While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use. Disclaimer: The images and values depicted in this manual are for illustration purposes only and may vary to actual values.

CIGWELD BLUEVENOM XF210⁶ OPERATING MANUAL FOR P/N W1400210

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RECORD THE FOLLOWING INFORMATION FOR WARRANTY PURPOSES:

Where Purchased:

Purchase Date:

Equipment Serial #:

BE SURE THIS INFORMATION REACHES THE OPERATOR. YOU CAN GET EXTRA COPIES FOR FREE BY DOWNLOADING FROM THE CIGWELD WEBSITE.

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, “Precautions and Safe Practices for Arc Welding, Cutting, and Gouging,” Booklet 0-5407. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

READ AND UNDERSTAND THE OPERATING MANUAL BEFORE INSTALLING OR OPERATING. PROTECT YOURSELF AND OTHERS!

CIGWELD
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DECLARATION OF CONFORMITY

According to AS/NZS 3820:2020, Essential Safety Requirements for Electrical Equipment Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017

TYPE OF EQUIPMENT

Arc welding power source

TYPE DESIGNATION

BlueVenom XF210⁶ with serial number from: WC543YYWW####

BRAND NAME OR TRADEMARK

CIGWELD

MANUFACTURER OR HIS AUTHORISED REPRESENTATIVE ESTABLISHED WITHIN THE EEA NAME, ADDRESS, AND TELEPHONE NO:

CIGWELD Pty Ltd 71 Gower Street
Preston, Victoria, Australia, 3072
Phone: +61 3 9474 7400;
cigweld.com.au

THE FOLLOWING HAS BEEN USED IN THE DESIGN:

AS 1674.2:2025	Safety in welding and allied processes, Part 2: Electrical
AS 60974.1:2020	Arc Welding Equipment, Part 1: Welding Power Sources
AS/NZS 3760:2022	In-service safety inspection and testing of electrical equipment and RCDs
EN IEC 60974-10: 2021	Arc Welding Equipment, Part 10: EMC requirements

ADDITIONAL INFORMATION:

Restrictive use, Class A equipment, intended for use in location other than residential. This equipment is also in compliance with the essential requirements of EU Directives 2014/30/EU and 2014/35/EU.

BY SIGNING THIS DOCUMENT, THE UNDERSIGNED DECLARES AS MANUFACTURER,OR THE MANUFACTURER'S AUTHORISED REPRESENTATIVE, THAT THE EQUIPMENT IN QUESTION COMPLIES WITH THE SAFETY REQUIREMENTS STATED ABOVE.

PLACE/DATE

Preston
23-01-2026

SIGNATURE

Jarrod Brennan
Managing Director

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SECTION 1: ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting machinery/equipment. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the Australian Standard AS 1674.2:2025 entitled: Safety in welding and allied processes Part 2: Electrical. This publication and other guides as to what you should learn before operating this equipment are listed at the end of these safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

1.01 ARC WELDING HAZARDS

WARNING

ARC RAYS can burn eyes and skin;
NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

ARC RAYS AND NOISE

1. Use a Welding Helmet or Welding Faceshield fitted with a proper shade of filter (see ANSI Z49.1 and AS 1674 listed in Safety Standards) to protect your face and eyes when welding or watching the welding operation.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.
6. Never wear contact lenses while welding.

WARNING

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on.

In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

ELECTRIC SHOCK

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Operating Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.

RECOMMENDED PROTECTIVE FILTERS FOR ELECTRIC WELDING

Description of process	Approximate range of welding current in amps	Minimum shade number of filter(s)
Manual Metal Arc Welding - covered electrodes (MMAW)	Less than or equal to 100	8
	100 to 200	10
	200 to 300	11
	300 to 400	12
	Greater than 400	13
Gas Metal Arc Welding (GWAW) (MIG) other than Aluminium and Stainless Steel	Less than or equal to 150	10
	150 to 250	11
	250 to 300	12
	300 to 400	13
	Greater than 400	14
Gas Metal Arc Welding (GMAW) (MIG) Aluminium and Stainless Steel	Less than or equal to 250	12
	250 to 350	13
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than or equal to 100	10
	100 to 200	11
	200 to 250	12
	250 to 350	13
	Greater than 350	14
Flux-cored Arc Welding (FCAW) - with or without shielding gas	Less than or equal to 300	11
	300 to 400	12
	400 to 500	13
	Greater than 500	14
Air - Arc Gouging	Less than or equal to 400	12
Plasma - Arc Cutting	50 to 100	10
	100 to 400	12
	400 to 800	14
Plasma - Arc Spraying	—	15
Plasma - Arc Welding	Less than or equal to 20	8
	20 to 100	10
	100 to 400	12
	400 to 800	14
Submerged - Arc Welding	—	2(5)
Resistance Welding	—	Safety Spectacles or eye shield

Refer to standard AS/NZS 1338.1:2012 for comprehensive information regarding the above table.

FUMES AND GASES

WARNING

FUMES & GASES CAN BE HAZARDOUS TO YOUR HEALTH.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING

WARNING

WELDING CAN CAUSE FIRE OR EXPLOSION.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35ft (10.7m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

FLYING SPARKS AND HOT METAL

WARNING

FLYING SPARKS & HOT METAL CAN CAUSE INJURY.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

CYLINDERS

WARNING

CYLINDERS CAN EXPLODE IF DAMAGED.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

MOVING PARTS

WARNING

Moving parts can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.

WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety code Sec. 25249.5 et seq.)

NOTE

Considerations About Welding and The Effects of Low Frequency Electric and Magnetic Fields.

WARNING

The procedures below are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "...there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields and interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding power source and cables as far away from body as practical.

1.02 PRINCIPAL SAFETY STANDARDS

Safety in welding and allied processes Part 1: Fire Precautions, AS 1674.1:2025 from SAI Global Limited, www.saiglobal.com.

Safety in welding and allied processes Part 2: Electrical, AS 1674.2:2025 from SAI Global Limited, www. saiglobal.com.

Filters for eye protectors - Filters for protection against radiation generated in welding and allied operations AS/NZS 1338.1:2012 from SAI Global Limited, www.saiglobal.com.

Welding Processes, Code of Practice, JULY 2020 - Safe Work Australia. This document provides "Practical guidance on how to manage health and safety risks associated with welding". **The latest version is available free of charge at: https://www.safeworkaustralia.gov.au/doc/model-code-practice-welding-processes.**

Other International Standards and Codes of Practice

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1,
from American Welding Society, 550 N.W. LeJeune Rd.,
Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

SECTION 2: INTRODUCTION

2.01 HOW TO USE THIS MANUAL

This Operating Manual only applies to the Part Numbers listed on page 3. To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words WARNING, CAUTION, and NOTE may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

NOTE

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION

A procedure which, if not properly followed, may cause damage to the equipment.

WARNING

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

ELECTRICAL WARNING

Gives information regarding possible electrical shock injury. Warnings will be enclosed in a box such as this.

DANGER

Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

Additional copies of this manual may be purchased by contacting CIGWELD at the address and phone number for your location listed in the inside back cover of this manual. Include the Operating Manual number and equipment identification numbers.

Electronic copies of this manual can also be downloaded at no charge in Acrobat PDF format by going to the CIGWELD web site listed below and clicking on the Literature Library link:
cigweld.com.au

2.02 EQUIPMENT IDENTIFICATION

The units identification number (specification or part number), model, and serial number are located on the Data Plate which is fixed to the bottom of the welding machine. In some cases, the Data Plate may be attached to the rear panel. Equipment which does not have a control panel such as cable assemblies are identified only by the specification or part number printed on the shipping container. Record these numbers on the bottom of page 3 for future reference.

2.03 RECEIPT OF EQUIPMENT

When you receive the equipment, check it against the invoice to confirm it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location listed on the back cover of this manual. Include all equipment identification numbers, as described above, along with a full description of the parts in error.

Move the equipment to the installation site before unboxing the unit. Use care to avoid damaging the equipment when using knives, breaker bars, hammers, etc, to unbox the machine and its accessories.

2.04 SYMBOL CHART

Note that only some of these symbols will appear on your model.

	ON	3 ~	THREE PHASE		PURGING OF GAS
	OFF		THREE PHASE STATIC FREQUENCY CONVERTER-TRANSFORMER-RECTIFIER		CONTINUOUS WELD MODE
	DANGEROUS VOLTAGE		REMOTE	t	SPOT WELD MODE
	INCREASE/ DECREASE	X	DUTY CYCLE		SPOT TIME
	CIRCUIT BREAKER	%	PERCENTAGE	t1	PREFLOW TIME
~	AC AUXILIARY POWER		SHIELDED METAL ARC WELDING (SMAW)	t2	POSTFLOW TIME
	FUSE		GAS METAL ARC WELDING (GMAW)		PLATE THICKNESS
A	AMPERAGE		GAS TUNGSTEN ARC WELDING (GTAW)	200A DC	OUTPUT CURRENT
V	VOLTAGE		AIR CARBON ARC CUTTING (CAC-A)	2 YEARS*	2-YEAR WARRANTY
Hz	HERTZ (CYCLES/SEC)		CONSTANT CURRENT	t	BURNBACK TIME
f	FREQUENCY		CONSTANT VOLTAGE OR CONSTANT POTENTIAL		DISTURBANCE IN GROUND SYSTEM
—	NEGATIVE		HIGH TEMPERATURE	IPM	INCHES PER MINUTE
+	POSITIVE		FAULT INDICATION	MPM	METRES PER MINUTE
	DIRECT CURRENT (DC)		ARC FORCE		SPOOL GUN
	PROTECTIVE EARTH (GROUND)		TOUCH START (GTAW)		PUSH PULL GUN
	LINE		VARIABLE INDUCTANCE		SINGLE PULSE
	LINE CONNECTION	V	VOLTAGE INPUT		DOUBLE PULSE
	AUXILIARY POWER		WIRE FEED FUNCTION		PULSE FREQ. (PULSE SPEED)
115V 15A ~	RECEPTACLE RATING- AUXILIARY POWER		WIRE FEED TOWARDS WORKPIECE WITH OUTPUT VOLTAGE OFF	A	PULSE BASE CURRENT
1 ~	SINGLE PHASE		WELDING GUN	W	PULSE WIDTH

Table 2-1: Symbol chart

2.05 DESCRIPTION

Get your adrenalin pumping with the new XF210⁶ – a compact, robust mean machine with Multiple processes and 3 Pulse modes: Single & Double Pulse MIG, STICK Pulse AND AC/DC TIG Pulse!

This predator packs impressive features and welding performance made easy to suit the serious welding enthusiast to the welding pro.

Don't want to weld Steel? Is Aluminium more your thing? Don't stress – the XF210⁶ can do it all and comes with a spare Graphene liner, Nylon Inlet guide and feed rollers for soft wires.

Want to tack thin gauge plates, the Cold Weld function is perfect. Cold Weld performs split second, high current bursts to allow you to tack thin plate, without blowing holes.

Release your inner Welditude™ with pre-installed Synergic AUTOSET programs for MIG (Single & Double Pulse), STICK and TIG functions! Simply choose your Material, Wire diameter, Gas Type, Joint Type (not all joint types are available for each Gas and Material type/thicknesses) and dial up the Plate Thickness you're welding and you're ready to go!

Navigate with ease through the intuitive 5" full colour display to custom set values to get the most out of your welds - from Voltage Trim and Adjustable Burnback to Hard and Soft start tweaks (Opti-Start Technology) the XF210⁶ doesn't hold back!

Weighing 22kg, this portable beast will have you welding in any pulse mode you like! To make things even better it's equipped with a 4x roll (cogged) all driven wire drive system for smooth and effortless wire feedability and is Spool Gun, TIG foot control compatible!

So the question is… are you ready to Harness the Power!

2.06 USER RESPONSIBILITY

This equipment will perform safely and reliably when installed, operated and maintained in accordance with the instructions herewith. Periodic checks are recommended as defective or poorly maintained equipment should not be used. Broken, missing, severely worn, distorted or contaminated parts should be replaced immediately.

Should a repair or replacement become necessary, it is recommended that the Authorised Distributor from whom the equipment was purchased, be contacted for service advice. The owner or user of this equipment shall have the responsibility for any malfunction which results from improper use, damage, faulty maintenance or repair/alteration by other than CIGWELD or an accredited service provider.

NOTE

Refer to the complete Warranty Schedule at the back of the manual.

2.07 WHAT'S IN THE BOX

XF210⁶ Inverter (Part No. W1400210)

- BlueVenom XF210⁶ Power Source.
- MIG Gun BZ24 3m with 4 Button Digital Control with Steel Liner Fitted.
- TIG Torch 26F Flex Head 4m with Current Control.
- Work Clamp 300A with 3m Lead.
- Twist Lock Electrode Holder 200A with 3m Lead.
- Feed Rolls: 0.8/0.9mm V Groove (fitted), 0.8/0.9mm Gasless Knurled, 1.0/1.2mm U Groove.
- Gas Regulator/Flowmeter.
- Quick Connect Gas Hose 2m.
- Nylon Inlet Guide for Soft Wires.
- Steel Inlet and Outlet Guide.
- Operating Manual.
- TIG Consumables Kit.

2.08 TRANSPORTING METHODS

This unit is equipped with a handle for carrying purposes.

WARNING

FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Lift unit with handle on top of case.
- Use handcart or similar device of adequate capacity.
- If using a forklift vehicle, place and secure unit on a proper skid before transporting.

2.09 DUTY CYCLE

The rated duty cycle of a Welding Power Source, is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 15% duty cycle, 90 amperes at 23.6 volts. This means that it has been designed and built to provide the rated amperage (90A) for 1.5 minutes, i.e. arc welding time, out of every 10 minute period (15% of 10 minutes is 1.5 minutes). During the other 8.5 minutes of the 10 minute period the Welding Power Source must idle and allowed to cool.

2.10 SPECIFICATIONS

DESCRIPTION	BLUEVENOM XF210⁶
Packaged Part Number	W1400210
Power Source Dimensions	(L) 610mm x (W) 215mm x (H) 370mm
Power Source Weight	22kg
Cooling	Fan Cooled
Welder Type	Multi Process Inverter Power Source
Standards	AS 60974.1:2020 EN IEC 60974-10:2021
Number of Phases	Single Phase
Nominal Supply Voltage	230 VAC ± 10%
Nominal Supply Frequency	50/60Hz
Welding Current Range (MIG mode)	30-210A
Welding Current Range (Stick mode)	40-185A
Welding Current Range (TIG Mode)	10-210A
Nominal DC Open Circuit Voltage MIG Weld Mode	78V
Open Circuit Voltage (VRD On) Stick Weld Mode	<35V
Open Circuit Voltage (VRD Off) Stick Weld Mode	78V
Effective Input Current (I1eff) refer Note 2	14.7 Amps (230VAC)

DESCRIPTION	BLUEVENOM XF210⁶
Maximum Input Current (I1max)	29.5 Amps (230VAC)
Minimum Single Phase Generator Recommendation (refer Note 4)	8.5kVA@0.8PF
MIG (GMAW) Welding Output, 40°C, 10 min	210A @ 25%, 24.5V 136A @ 60%, 20.8V 105A @ 100%, 19.3V
Stick (MMAW) Welding Output, 40°C, 10 min	185A @ 25%, 27.4V 119A @ 60%, 24.8V 93A @ 100%, 23.7V
TIG (GTAW) Welding Output, 40°C, 10 min	210A @ 35%, 18.4V 160A @ 60%, 16.4V 124A @ 100%, 15V
Protection Class	IP23S

Table 2-2: Specifications

NOTE 1: Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

NOTE 2: The Effective Input Current should be used for the determination of cable size & supply requirements.

NOTE 3: Motor start fuses or thermal circuit breakers are recommended for this application. Check local requirements for your situation in this regard.

NOTE 4: Minimum Generator Recommendation at the Maximum Output Duty Cycle. Due to large variations in performance and specifications of different brands and types of generators, CIGWELD cannot guarantee full welding output power or duty cycle on every brand or type of generator. Some small generators incorporate low cost circuit breakers on their outputs. These circuit breakers usually will have a small reset button, and will trip much faster than a switchboard type circuit breaker. This may result in not being able to achieve full output or duty cycle from the power source / generator combination. For this reason we recommend a generator that incorporates switchboard type circuit breakers. CIGWELD recommends that when selecting a generator, that the particular power source / generator combination be adequately trialled to ensure the combination performs to the users expectations.

NOTE 5: CIGWELD reserves the right to change product performance and specifications without notice.

NOTE 6: If an extension lead is required to be used it is recommended to use a minimum size of 2.5mm^2 Heavy Duty Extension Lead. Longer extension leads may impact welding performance and operation.

2.11 OPTIONAL ACCESSORIES

We recommend genuine CIGWELD products. The biggest range and best quality with guaranteed performance.

PART NUMBER	DESCRIPTION
BZN2410	Nozzle Tapered, 10mm, Pack of 2
BZN2413	Nozzle Conical, 13mm, Pack of 2
BZN2417	Nozzle Cylindrical, 17mm, Pack of 2
BZT6806	Contact Tip 0.6mm M6 L: 28mm, Pack of 10
BZT6808	Contact Tip 0.8mm M6 L: 28mm, Pack of 10
BZT6809	Contact Tip 0.9mm M6 L: 28mm, Pack of 10
BZT6810	Contact Tip 1.0mm M6 L: 28mm, Pack of 10
BZT6812	Contact Tip 1.2mm M6 L: 28mm, Pack of 10
BZT6814	Contact Tip 1.4mm M6 L: 28mm, Pack of 10
BZH24M6	Tip Holder, M6, Pack of 2
BZD24S	Diffuser Silicone, Pack of 2
BZD24	Diffuser Standard, Pack of 2
CML50609	MultiLiner Steel 0.6-0.9mm, 5.1m (No collet), Pack of 1
CML50912	MultiLiner Steel 0.9-1.2mm, 5.1m (No collet), Pack of 1
CML50916A	MultiLiner Aluminium 0.9-1.6mm, 4.5m (No collet), Pack of 1
CMLCBZ	MultiLiner Collet suit Binzel, Pack of 1
CMLCBZA	MultiLiner Alloy Collet suit Binzel, Pack of 1
W4020012	CIGWELD MIG Gun BZ24 Euro 3m with 4 Button Digital Control
W4020013	CIGWELD MIG Gun BZ24 Euro 4m with 4 Button Digital Control
W4020014	CIGWELD MIG Gun BZ24 Euro 5m with 4 Button Digital Control
FR302210V0608	Feed Roll 0.6/0.8mm V Groove (Solid Wires)
FR302210V0809	Feed Roll 0.8/0.9mm V Groove (Solid Wires) included with machine
FR302210V1012	Feed Roll 1.0/1.2mm V Groove (Solid Wires)
FR302210U0809	Feed Roll 0.8/0.9mm U Groove (Soft Wires)
FR302210U1012	Feed Roll 1.0/1.2mm U Groove (Soft Wires)

PART NUMBER	DESCRIPTION
FR302210K0809	Feed Roll 0.8/0.9mm V Knurled (Flux Cored) included with machine
W7007437	Spring Steel Inlet Guide (Steel and Stainless Steel Wires)
W7007384	Nylon Inlet Guide (Soft Wires)
W4022013	TIG TORCH 26 with Remote, 4m
W4022014	TIG TORCH 26 with Remote, 8m
W4022015	TIG TORCH 26F Flex Head With Remote, 4m
W4022016	TIG TORCH 26F, Flex Head With Remote, 8m
CT1726K1	TIG Starter Kit 1 17/18/26 TIG Torches
W4021001	CIGWELD BZ24 Spool Gun, 6m, Euro
W4015826	Foot Pedal CW 8m 8Pin
W7004913	Shielding Gas Hose Assembly
210254	BlueJet Argon Regulator/ Flowmeter, 55LPM, 2 Gauge
201031	BlueJet Preset Argon Regulator/ Flowmeter Side Inlet
CWPLIER	MIG Pliers 8-Function, Cut Wire, Clean Nozzle, Remove Hot Nozzle, Pick up & hold hot welding jobs/pieces, Remove Contact Tip, Cut/Trim Spring Steel Liner, Long Nose Pliers, Mini Hammers to tap out spatter in the nozzle
W4011504	Arc Trolley L
WS42550	WeldSkill Welding Leadset 4m, 25mm² cable, 50mm² DINSE, 250A Twistlock Electrode Holder
WS53550	WeldSkill Welding Leadset 5m, 35mm² cable, 50mm² DINSE, 400A Twistlock Electrode Holder

2.12 RELATED PRODUCTS

PART NUMBER	DESCRIPTION
646766	WeldSkill Heavy Duty Welding Gloves - Medium
646755	WeldSkill Heavy Duty Welding Gloves - Large
646767	WeldSkill Heavy Duty Welding Gloves – XL
646771	WeldSkill Welding Jacket - Medium
646772	WeldSkill Welding Jacket - Large
646773	WeldSkill Welding Jacket - XL
646774	WeldSkill Welding Jacket - XXL
457766	ARCUP Voyager Backpack
WHAMXC090F	Arcmaster XC90F Auto Darkening Welding Helmet Variable Shade 4-8 / 9-14 - Blax

PART NUMBER	DESCRIPTION
WHAMXC170	Auto Darkening Welding Helmet Variable Shade 4-8 / 9-14 - Mayhem
646782	WeldaToolz Multi-Angle Magnet 55kg force
646785	WeldaToolz Switchable Arrow Magnet 42kg force
646770	ARCUP Welding Curtain – Dark Green, 1.8m x 1.8m
646777	ARCUP Welding Curtain – Red, 1.8m x 1.8m
646776	Welding Curtain Frame, 1.8m x 1.8m
646801	Welding Blanket, 1.8m x 1.8m
646802	Welding Blanket, 2m x 2m
646803	Welding Blanket, 3m x 3m

MIG Pliers
P/N: CWPLIER

Magnetic Clamps
P/N: 646782 (Multi-Angle Magnet 55kg)
P/N: 646785 (Switchable Arrow Magnet 42kg force)

WELDSKILL Heavy Duty Leather Welding Gloves
P/N: 646755 (Large)
P/N: 646767 (XL)

Arcmaster XC70 Welding Helmet (Mayhem)
P/N: WHAMXC170

WeldSkill Welding Jacket
P/N: 646772 (Large)

Nozzle Conical 13mm
P/N: BZN2413

Diffuser Standard
P/N: BZD24

Tip Holder M6
P/N: BZH24M6

SECTION 3: INSTALLATION

3.01 ENVIRONMENT

These units are designed for use in environments with increased hazard of electric shock.

A. Examples of environments with increased hazard of electric shock are:

1. In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts.
2. In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator.

B. Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

3.02 LOCATION

Be sure to locate the welder according to the following guidelines:

A. In areas, free from moisture and dust.

B. Ambient temperature between -10°C to 40°C.

C. In areas, free from oil, steam and corrosive gases.

D. In areas, not subjected to abnormal vibration or shock.

E. In areas, not exposed to direct sunlight or rain.

F. Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.

3.03 VENTILATION

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

3.04 MAINS SUPPLY VOLTAGE REQUIREMENTS

The Mains Supply Voltage should be within ± 15% of the rated Mains Supply Voltage. If actual Mains Supply Voltage is outside this range Welding Current may not be available and may cause internal components to fail.

Refer to Specifications on page 17 for Supply Voltage information.

The Welding Power Source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size power point and fuse as per the Specifications on page 17.

IMPORTANT NOTE!

This product has been fitted with a supply plug as indicated in Section 2.10. Note that the welding output range applicable with the fitted supply plug is detailed in Section 2.10.

WARNING

Any electrical work must be carried out by a qualified Electrical Tradesperson.

3.05 GENERATORS

Refer to Note 4 on page 18 for recommendations when using with a Generator.

3.06 EXTENSION LEADS

If an extension lead is required to be used it is recommended to use a minimum size of 2.5mm² Heavy Duty Extension Lead. Longer extension leads may impact welding performance and operation.

3.07 ELECTROMAGNETIC COMPATIBILITY

WARNING

Extra precautions for Electromagnetic Compatibility may be required when this Welding Power Source is used in a domestic situation.

A. INSTALLATION AND USE - USERS RESPONSIBILITY

The user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit. In other cases it could involve constructing an electromagnetic screen enclosing the Welding Power Source and the work, complete with associated input filters. In all cases, electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.

B. ASSESSMENT OF AREA

Before installing welding equipment, the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account

1. Other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment.
2. Radio and television transmitters and receivers.
3. Computer and other control equipment.
4. Safety critical equipment, e.g. guarding of industrial equipment.
5. The health of people around, e.g. the use of pacemakers and hearing aids.
6. Equipment used for calibration and measurement.
7. The time of day that welding or other activities are to be carried out.
8. The immunity of other equipment in the environment: the user shall ensure that other equipment being used in the environment is compatible: this may require additional protection measures.

   The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

C. METHODS OF REDUCING ELECTROMAGNETIC EMISSIONS

1. **Mains Supply**
   Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout it's length. The shielding should be connected to the Welding Power Source so that good electrical contact is maintained between the conduit and the Welding Power Source enclosure.
2. **Maintenance of Welding Equipment**
   The welding equipment should be routinely maintained according to the manufacturer's recommendations.

All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

3. **Welding Cables**
   The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

4. **Equipotential Bonding**
   Bonding of all metallic components in the welding installation and adjacent to it should be considered. However Metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching the metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

5. **Earthing of the Workpiece**
   Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of it's size and position, e.g. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

6. **Screening and Shielding**
   Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening the entire welding installation may be considered for special applications.

3.08 HIGH FREQUENCY ARC INITIATION OR STABILISATION (WHERE FITTED)

The importance of correct installation of high frequency welding equipment cannot be over emphasized. Interference due to high frequency initiated or stabilised arc is almost invariably traced to improper installation. The following information is intended as a guide for personnel installing high frequency welding machines

WARNING

The high frequency section of this machine has an output similar to a radio transmitter. The machine should NOT be used in the vicinity of blasting operations due to the danger of premature firing.

WARNING

It is also possible that operation close to computer installations may cause computer malfunction.

Direct Radiation: Radiation from the machine can occur if the case is metal and is not properly grounded. It can occur through apertures such as open access panels. The shielding of the high frequency unit in the Power Source will prevent direct radiation if the equipment is properly grounded. Arrange cables to one side and away from the operator.

Transmission via the Supply Lead: Without adequate shielding and filtering, high frequency energy may be fed to the wiring within the installation (mains) by direct coupling. The energy is then transmitted by both radiation and conduction. Adequate shielding and filtering is provided in the Power Source.

Radiation from Welding Leads: Radiated interference from welding leads, although pronounced in the vicinity of the leads, diminishes rapidly with distance. Keeping leads as short as possible will minimise this type of interference. Looping and suspending of leads should be avoided wherever possible from body as practical.

Re-Radiation from Unearthed Metallic Objects: A major factor contributing to interference is reradiation from unearthed metallic objects close to the welding leads. Effective grounding of such objects will prevent re-radiation in most cases.

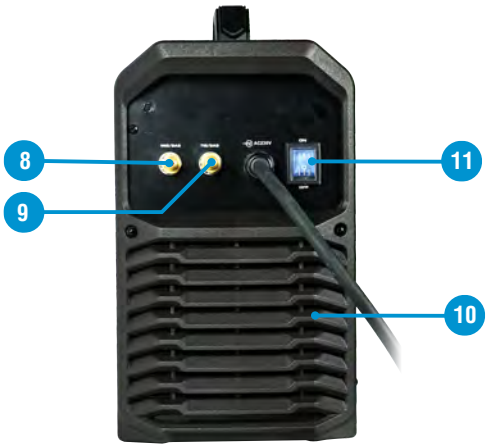
SECTION 4: OPERATION

4.01 OVERVIEW

Standard operating procedures apply when using these Welding machines, i.e. connect work lead directly to workpiece with the spring loaded clamp. The MIG wire is fed from the spool through the feed roller system and into the MIG Gun (consult CIGWELD or the electrode wire manufacturers information for the correct polarity).

The welding amperage range (plate thickness pre-set) values should be used as a guide only. Current delivered to the arc is dependent on the Wire Feed Speed and welding arc voltage, and as welding arc voltage varies between different classes of MIG wire, welding current at given settings could vary accordingly to the type of MIG wire in use. The operator should use the plate thickness pre-set welding current values as a guide, then finally adjust the current setting to suit the application, by fine tuning the WFS / Amps and Volts / Trim settings.

4.02 POWER SOURCE CONTROLS,INDICATORS AND FEATURES



1. Control Panel.
2. MIG Gun Adaptor (Euro Style). Refer also to page 26.
3. MIG Gun Polarity Lead. Refer also to page 26.
4. Remote Control Socket 8 Pin. Refer also to page 26.
5. TIG Torch Shielding Gas Outlet.
6. Positive Output Welding Terminal.
7. Negative Output Welding Terminal.
8. MIG Shielding Gas Inlet. Refer also to page 27.
9. TIG Shielding Gas Inlet. Refer also to page 27.
10. Fan On Demand. Refer also to page 28.
11. Power On/Off Switch. Refer also to page 28.
12. Wire Inch and Gas Purge. Refer also to page 28.

Figure 4-1: Controls, Indicators and Features

1 CONTROL PANEL

The BlueVenom XF210⁶ is equipped with a 5" full colour screen enabling you to toggle through the many features and advanced settings with ease! A minimalist control panel with an intuitive user interface.

Figure 4-2: Controls Panel

.

2 MIG GUN ADAPTOR (EURO STYLE)

The MIG Gun adaptor is the connection point for the MIG welding gun. Connect the gun by aligning and pushing the connector into the brass gun adaptor firmly and screwing the plastic nut clockwise to secure in position. To remove the MIG Gun simply reverse these directions. Refer to Section 5.02.

3 MIG GUN POLARITY LEAD

The polarity lead is used to connect the MIG Gun to the appropriate positive or negative output terminal (allowing polarity reversal for different welding applications). The polarity lead should be connected in to the positive welding terminal (+) when using solid steel, stainless steel or aluminium MIG wire. When using gasless wire, the polarity lead is connected to the negative welding terminal (-). If in doubt, consult the manufacturer of the electrode wire for the correct polarity. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the twist & lock terminal, known as a DINSE Connector.

4 REMOTE CONTROL SOCKET 8 PIN

The 8 pin Remote Control Socket is used to connect remote control devices (i.e. Spool Gun, TIG Torch or Foot Control) to the welding power source. To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

In TIG mode if current control is required via the TIG torch, the user must select REMOTE TORCH or FOOT PEDAL in the settings screen.

If current control is not required on the TIG Torch, the user can select FRONT PANEL via the settings screen. This will allow the user to preset the current required on the Power Source, and simply use the TIG torch trigger to start the arc.

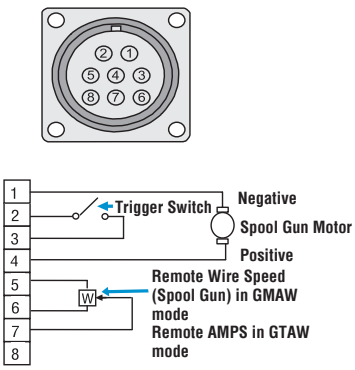


Figure 4-3: Remote Control Socket 8 Pin

Socket Pin	Description
1	Spool gun motor negative
2	Trigger Switch Input
3	Trigger Switch Input
4	Spool gun motor positive
5	Remote Control Potentiometer - Maximum
6	Remote Control Potentiometer - Minimum
7	Remote Control Potentiometer - Wiper - Wire Speed control when in MIG mode - Current control when in TIG mode
8	Not connected

5 TIG TORCH SHIELDING GAS OUTLET

The TIG Torch Shielding Gas Outlet is used to connect the TIG Torch gas hose to the machine.

6 POSITIVE OUTPUT WELDING TERMINAL

The positive welding terminal is used to connect the welding output of the power source to the appropriate welding accessory such as the MIG Gun (via the MIG Gun polarity lead), electrode holder lead or work lead. Positive welding current flows from the power source via this twist & lock terminal, known as a DINSE Connector. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.

7 NEGATIVE OUTPUT WELDING TERMINAL

The negative welding terminal is used to connect the welding output of the power source to the work lead. Most General Purpose electrodes are connected with work lead (Earth Clamp) to negative. Consult the electrode manufacturer's information for the correct polarity. Welding current flows from the workpiece via this twist & lock terminal, known as a DINSE Connector to the power source. It is essential, that the male DINSE type plug is inserted and turned securely to achieve a sound electrical connection. Do not over Tighten.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the DINSE terminal.

8 MIG SHIELDING GAS INLET

The MIG Shielding Gas Inlet is a Quick Connect inlet fitting located on the rear of the machine which is used to supply the appropriate MIG welding gas to the unit. Refer to section 5.01.

9 TIG SHIELDING GAS INLET

The TIG Shielding Gas Inlet connection is a Quick Connect inlet fitting located on the rear of the machine which is used to supply the appropriate TIG welding gas to the unit. Refer to section 6.02.

NOTE

The appropriate Shielding Gas inlet must be used for the welding process being used. The MIG Shielding Gas inlet supplies gas to the Euro connector for the MIG gun, and the TIG Shielding gas Inlet supplies gas for the TIG Shielding Gas outlet for the TIG Torch. If the appropriate Gas inlet isn't used, it will not provide gas for the welding process being used.

WARNING

Only Inert Shielding Gases specifically designed for welding applications should be used.

10 FAN ON DEMAND

The BlueVenom XF210⁶ is fitted with a fan on demand feature. Fan on demand automatically switches the cooling fan off when it is not required. This has two main advantages; (1) to minimize power consumption, and (2) to minimise the amount of contaminants such as dust that are drawn into the power source. Note that the fan will only operate when required for cooling purposes and will automatically switch off when not required.

11 POWER ON/OFF SWITCH

This switch is used to turn the unit ON/OFF. When this switch is turned ON the Colour Screen on the front panel will illuminate.

NOTE

If the Power Source is repeatedly switched On then Off rapidly or the supply to the power source is turned On and Off rapidly it may not turn On due to inbuilt protective devices acting. If this occurs leave the Power Source On/Off switch turned to the Off position for several minutes to allow for the protective devices to reset.

12 WIRE INCH AND GAS PURGE

WIRE INCH

Hold button depressed to Feed the MIG Wire through the MIG Gun.

GAS PURGE

This purges Shielding Gas through the MIG Gun or TIG Torch when depressed.

Figure 4-4: Wire Inch and Gas Purge

SECTION 5:
MIG (GMAW/FCAW) WELDING

5.01 SHIELDING GAS REGULATOR/FLOWMETER OPERATING INSTRUCTIONS

SHIELDING GAS CONNECTION

WARNING

This equipment is designed for use with welding grade (Inert) shielding gases only.

A Preset Argon Regulator/Flowmeter and Gas Hose Kit comes with the machine plant. Connect the gas regulator onto the gas cylinder/bottle by hand, keeping the round sight gauge in the vertical position. Then tighten the nut with a spanner, but do-not over tighten. Connect the gas hose to the threaded outlet on the right-hand side of the regulator (Picture A) and tighten with a spanner. Connect the other end of the gas hose to gas inlet fitting on the rear panel of the welding machine using the supplied Quick Connect fittings. Check for any leaks with soapy water in a squeeze bottle, and look for bubbles (when the gas is on), this will highlight any gas leaks.

The gas flow (in Litres Per Minute) for shielding the molten weld metal from the atmosphere is adjustable and depends on the job and atmospheric conditions you encounter when welding. As a general rule for MIG Welding, always use a minimum of 12 LPM when welding with an amperage range of under 100Amps, a min. of 15 LPM when the amperage is under 180Amps and a minimum of 18 LPM for welding amperages over 200Amps. A lower gas flow will affect the welding quality and cause a porous weld while high gas flow results in bigger consumption of gas.

The flow rate is measured at the middle of the float ball.

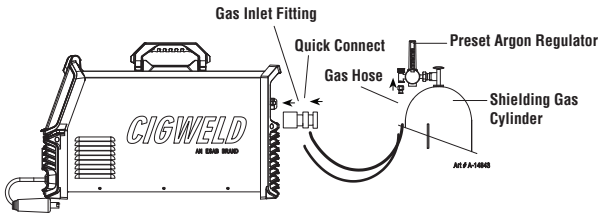


Figure 5-1: Shielding Gas Connection

SHIELDING GAS REGULATOR/ FLOWMETER SAFETY

An Argon Regulator/Flowmeter and Gas Hose comes with the machine plant.

This Regulator/Flowmeter is designed to reduce and control high pressure gas from a cylinder to the working pressure required for the equipment using it.

If the equipment is improperly used, hazardous conditions are created that may cause accidents. It is the users responsibility to prevent such conditions. Before handing or using the equipment, understand and comply at all times with the safe practices prescribed in this instruction.

SPECIFIC PROCEDURES for the use of regulators/ flowmeters are listed below.

1. **NEVER** subject the Regulator/Flowmeter to an inlet pressure greater than its rated inlet pressure.
2. **NEVER** pressurize a Regulator/Flowmeter that has loose or damaged parts or is in a questionable condition. NEVER loosen a connection or attempt to remove any part of a Regulator/Flowmeter until the gas pressure has been relieved. Under pressure, gas can dangerously propel a loose part.
3. **DO NOT** remove the Regulator/Flowmeter from a cylinder without first closing the cylinder valve and releasing gas in the Regulator/Flowmeter high and low pressure chambers.
4. **TURN OFF** When equipment is not in use for extended periods of time, shut off the gas at the cylinder valve and release the gas from the equipment.
5. **OPEN** the cylinder valve SLOWLY. Close after use.

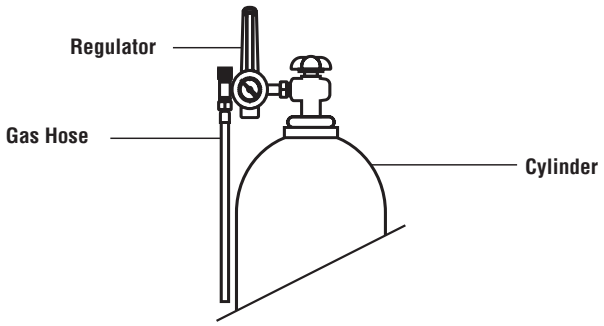


Figure 5-2: Fit Regulator/Flowmeter to Cylinder

INSTALLATION

1. Remove cylinder valve plastic dust seal. Clean the cylinder valve outlet of impurities that may clog orifices and damage seats before connecting the Regulator/Flowmeter.
   Crack the valve (open then close) momentarily, pointing the outlet away from people and sources of ignition. Wipe with a clean lint free cloth.
2. Match Regulator/Flowmeter to cylinder. Before connecting, check that the Regulator/Flowmeter label and cylinder marking agree and that the Regulator/Flowmeter inlet and cylinder outlet match. NEVER CONNECT a Regulator/Flowmeter designed for a particular gas or gases to a cylinder containing any other gas.
3. Connect the Regulator/Flowmeter inlet connection to cylinder or pipeline and tighten it firmly but not excessively, with a suitable spanner.
4. Connect and tighten the outlet hose firmly and attach the hose to the welding machine with the Quick Connect fitting. Ensure no gas leakage. The flowmeter must be in the vertical position to read accurately.

OPERATION

With the Regulator/Flowmeter connected to cylinder or pipeline:

1. Stand to one side of Regulator/Flowmeter and slowly open the cylinder valve. If opened quickly, a sudden pressure surge may damage internal Regulator/Flowmeter parts.
2. Since the regulator is a preset type, no adjustments to the regulator are necessary. Before opening the cylinder valve, be sure that the flow adjusting valve is in a finger-tight “OFF” position (clockwise).
3. Slowly and carefully, open the cylinder valve until the maximum pressure registers on the high pressure gauge.

CAUTION

DO NOT purge oxidising or flammable gases in the presence of flame, lit cigarettes, or other sources of ignition or in a confined space.

Close equipment valve(s) after purging, and test all connections for leaks with a suitable leak detection solution or soapy water. Never use a flame when testing for leaks.

CAUTION

Match Regulator/Flowmeter to cylinder. NEVER CONNECT a Regulator/Flowmeter designed for a particular gas or gases to a cylinder containing any other gas.

5.02 ATTACHING THE DIGITAL CONTROL MIG GUN

The BlueVenom XF210⁶ comes with a BZ24 4 Button Digital Control MIG Gun. The Digital Controls allows the user to make small adjustments to the welding parameters from the MIG gun without needing to return to the machine to adjust. Please note: adjustments can not be made whilst welding, they must be done prior to the commencement of the weld.

Fit the MIG Gun to the power source by pushing the MIG Gun connector into the MIG Gun adaptor and screwing the plastic nut clockwise to secure the MIG Gun to the MIG Gun adaptor.

1. AutoSet Mode Plate Thickness Increase, Manual Mode Wire Feed Speed Increase.
2. AutoSet Mode Volts Trim Decrease, Manual Mode Voltage Decrease.
3. AutoSet Mode Volts Trim Increase, Manual Mode Voltage Increase.
4. AutoSet Mode Plate Thickness Decrease, Manual Mode Wire Feed Speed Decrease.

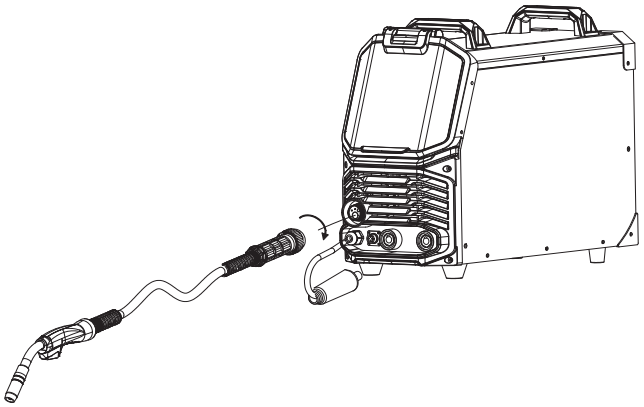


Figure 5-4: Attaching the Euro MIG Gun

5.03 INSTALLING MIG WIRE SPOOLS

As delivered from the factory, the unit is fitted with a Wire Spool Hub which accepts 100mm and 200mm Spool diameters.

In order to fit a 100m spool assemble parts in the sequence shown below in Figure 5-5.

In order to fit a 200m spool assemble parts in the sequence shown below in Figure 5-6.

Adjustment of the Spool Hub Retaining Nut will control the MIG Wire Spool Brake. Clockwise rotation of this nut tightens the brake. The Brake is correctly adjusted when the spool stops within 10 to 20mm (measured at the outer edge of the spool) after MIG Gun trigger is released. Wire should be slack without becoming dislodged from the spool.

NOTE

This spool hub nut can be removed by unscrewing in an anticlockwise direction and locating in the appropriate position.

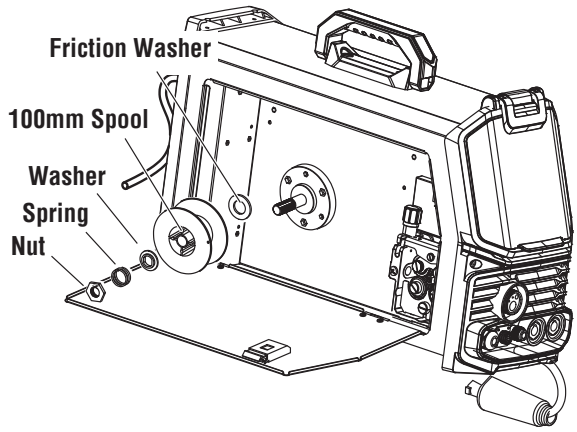


Figure 5-5: 100mm Spool Installation

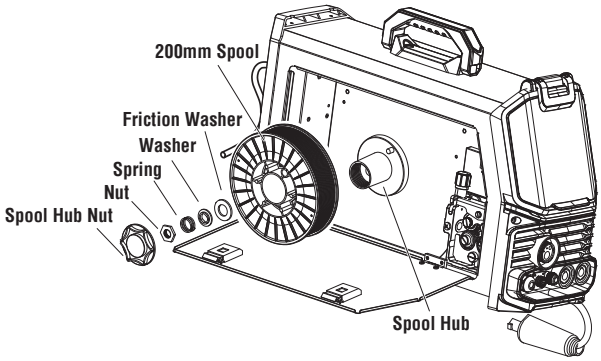


Figure 5-6: 200mm Spool Installation

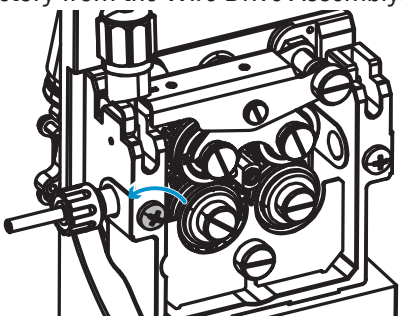
5.04 CHANGING INLET GUIDE FOR ALUMINIUM AND SOFT WIRES

A spare Nylon Inlet Guide is supplied with the machine. It is recommended to use this with Aluminium and Other Soft Wires.

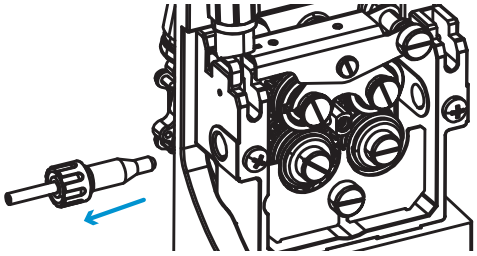
Before changing the Inlet Guide ensure wire is removed from the MIG Gun and Wire Drive system and Wire Spool is removed from the Spool Hub.

A. Loosen Inlet Guide retaining screw as shown.

B. Remove the Steel Inlet Guide as fitted to the machine from factory from the Wire Drive Assembly.

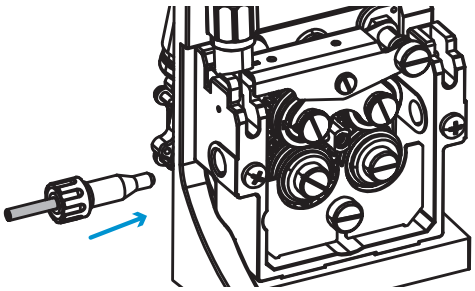


C. Fit the Aluminium Inlet Guide into the Wire Drive Assembly as shown and tighten the retaining screw.



D. Fit the appropriate feed roll to suit Aluminium wire being used. Refer to sections 5.09 Changing Feed Roll and section 2.11 Optional Accessories.

E. Install the wire spool and carefully feed the Aluminium wire into the feed mechanism. Refer to sections 5.03,



F. 5.04, 5.05 and 5.07 for further information.

A replacement Inlet Guide is available.
Refer to section 2.11 Optional Accessories.

5.05 SPOOL HUB BRAKE

When fitting the Wire Spool, the adjustment of the nut will control the MIG Wire Spool Brake. Rotating the nut clockwise increases the brake and rotating the nut counterclockwise reduces the brake. To access the nut remove the Spool Hub Wire Spool retaining Cap. Brake is correctly adjusted when the spool stops within 10 to 20mm (measured at the outer edge of the spool) after MIG Gun trigger is released. Wire should be slack without becoming dislodged from the spool.

WARNING

Moving Parts can cause injury!

WARNING

Overtension of brake will cause rapid wear of mechanical WIREFEED parts, overheating of electrical componentry and possibly an increased incidence of electrode wire Burnback into contact tip.

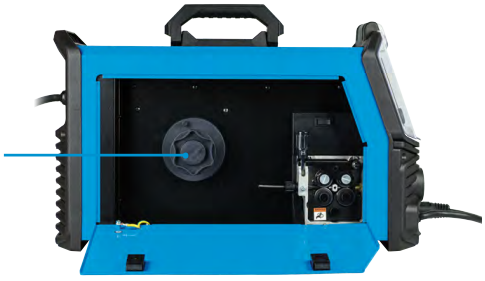


Figure 5-7: Wire Reel Brake

5.06 INSERTING WIRE INTO THE WIRE FEED MECHANISM

Release the tension from the pressure roller by turning the adjustable wire drive tension screw in an anticlockwise direction. Then to release the pressure roller arm, pull the wire drive tension screw outward to release the pressure roller arm (Figure 5-8). With the MIG welding wire feeding from the bottom of the spool (Figure 5-9) pass the wire through the inlet guide, between the rollers, through the outlet guide and into the MIG Gun. Do not release the MIG wire until the Pressure Arm is secured back into place. Adjust the wire drive tension screw accordingly. (Refer to Section 5.07) Remove the contact tip from the MIG Gun. With the MIG Gun lead reasonably straight, feed the wire through the Gun by pressing the Wire Inch button inside the machine, or by depressing the trigger switch. Fit the appropriate contact tip.

WARNING

Keep hands clear of the contact tip holder while feeding wire through to the gun. The wire can easily pierce you skin resulting in injury.

Keep MIG Gun away from eyes and face.

NOTE

A spare Nylon Inlet Guide is supplied with the machine. Use this with Aluminium and other Soft Wires.

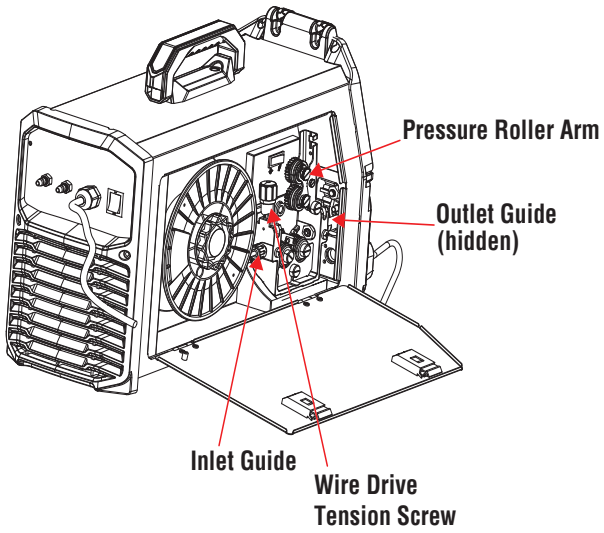


Figure 5-8: Wire Drive Assembly Components

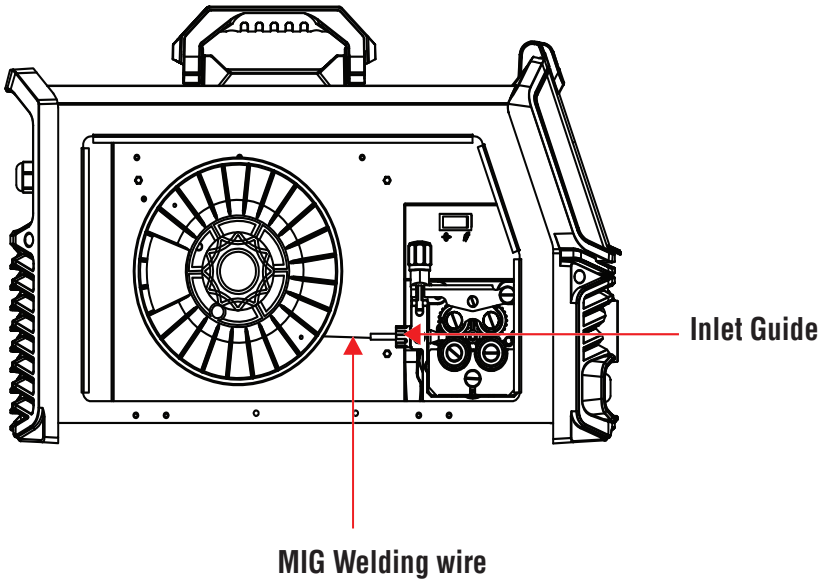


Figure 5-9 Feed Roll Pressure Adjustment

5.07 FEED ROLL PRESSURE ADJUSTMENT

The pressure (top) rollers apply pressure to the grooved feed roll via an adjustable pressure screw. These devices should be adjusted to a minimum pressure that will provide satisfactory WIREFEED without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If it is not the cause of slipping, the feed roll pressure can be increased by rotating the pressure screw clockwise.

A simple check for the correct drive tension is to bend the end over of the wire (once out the end of the MIG Gun) and hold it about 50mm from a piece of wood (an insulated object) and let it run into the wood. The wire should coil up without stopping and slipping at the drive rollers, tighten the pressure/tension adjustment screw if it slips.

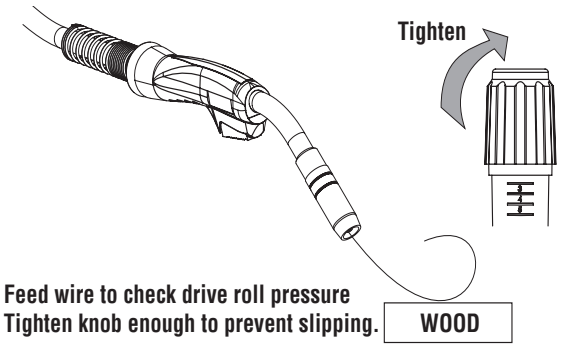


Figure 5-10: Feed Roll Pressure Adjustment

WARNING

Keep hands clear of the contact tip holder while feeding wire through to the gun. The wire can easily pierce you skin resulting in injury.

Keep MIG Gun away from eyes and face.

WARNING

Before changing the feed roll ensure that the mains supply to the power source is switched off.

CAUTION

The use of excessive pressure may cause rapid wear of the feed rolls, shafts and bearing.

5.08 CHANGING THE FEED ROLLS

ROLLSTo change the feed rolls, release the Wire Drive Tension Screw and lift the Pressure Roller Arm (top roller) up and out of the way. Loosen off and remove the feed roll retaining screws by turning in an anticlockwise direction.

Once the feed rolls are removed then to replace feed rolls, ensuring you have the correct groove size matching the wire size you are using in the the welder. Ensure the wire size required is the number facing outward on the feed roll when feed roll is installed. Reinstall by following these instructions in reverse.

A dual V groove feed roll is fitted as standard. It can accommodate 0.8/0.9mm (Gas Shielded Solid Wires). Markings are indicated on the side edge of the feed roll, for example 0.8V, 0.9V.

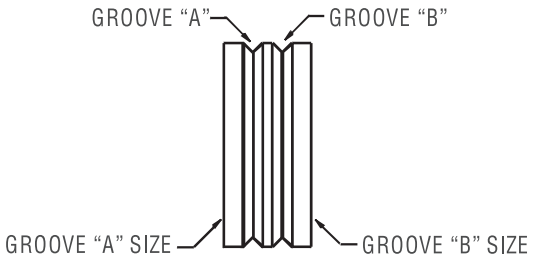


Figure 5-11: Dual Groove Feed Roll

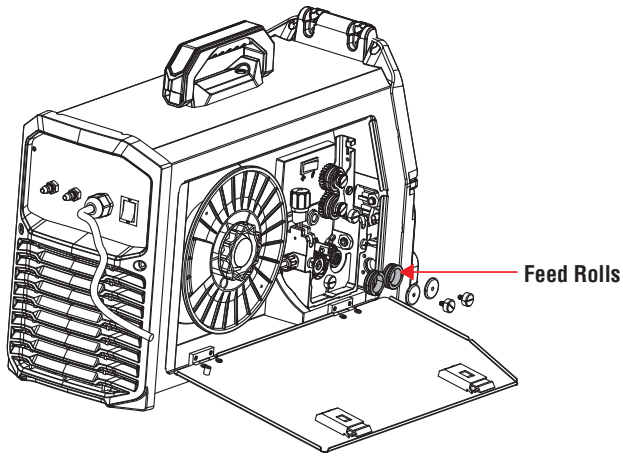


Figure 5-12: Changing the Feed Rolls

WARNING

Moving Parts can cause injury!

5.09 MIG MODE SETUP AND NAVIGATION

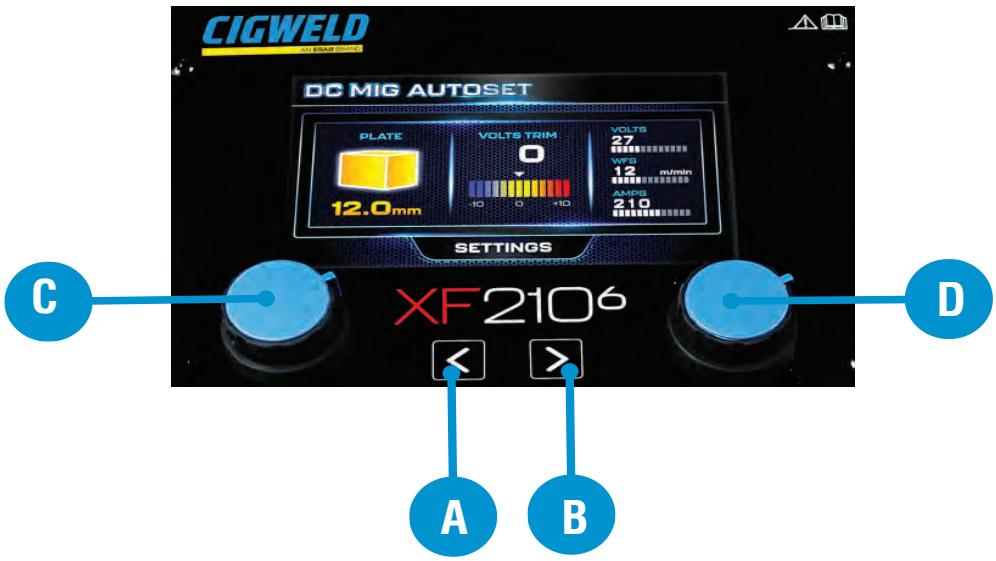


Figure 5-13: MIG Modes

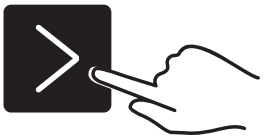
A. Back Button:

The Back Button is used to go backwards through each pages for each of the processes.

A long Press of the Back Button will return you to the Process Selection screen (Home).

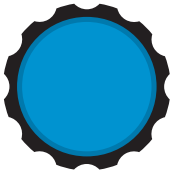
B. Forward Button:

The Forward Button is used to go forward to the next page for each of the processes.



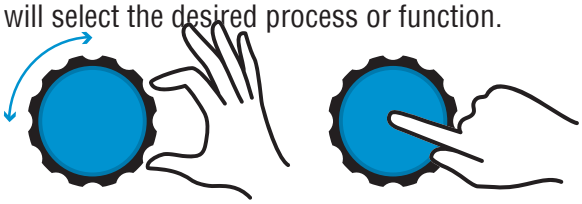
A long Press of the Forward Button will take you to the Memory Page.

C. Left Control Knob



The Left Control Knob is used to perform several different types of Functions.

In the Home Screen is it used to rotate through each of the Welding Processes, Memory and System Settings. When highlighted Yellow and depressed, it will select the desired process or function.

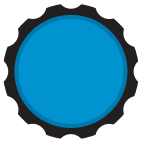


In the Autoset Wizard screens it is used to scroll through the Parameters such as Autoset or Manual, Material Type, Electrode Diameter, Joint Type and Plate Thickness. If depressed it will take you to the welding screen.

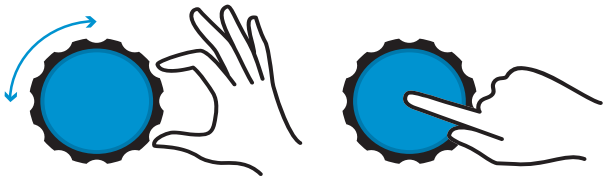
In the Settings Screens it is used to scroll through the Parameters such as Joint Type, Trigger Mode, Control Mode, Strike Method, Spot Weld Time, AC Wave, AC Balance, AC Frequency, Pre Flow, Start Current, Up Slope, Peak Current, Base Current, Pulse Width, Frequency, Down Slope, End Current, Post Flow, Hot Start, Hot Start Time, Arc Force and Pulse.

In manual mode it is used to adjust Amperage. Turn to make selection and press to confirm.

D. Right Control Knob



The Right Control Knob is used to perform several different types of Functions.



In the Home Screen it is not used.

In the Autoset Wizard screens it is used to adjust and set the Parameters for Material Type, Electrode Diameter, Joint Type and Plate Thickness.

In the Settings Screens it is used to adjust and set the parameters for Joint Type, Trigger Mode, Control Mode, Strike Method, Spot Weld Time, AC Wave, AC Balance, AC Frequency, Pre Flow, Start Current, Up Slope, Peak Current, Base Current, Pulse Width, Frequency, Down Slope, End Current, Post Flow, Hot Start, Hot Start Time, Arc Force and Pulse.

In manual mode it is used to adjust amperage in Stick mode.

Turn to make adjustment and press to confirm.

DC MIG Selections

The BlueVenom XF210⁶ has two modes of operation in DC MIG, Autoset and Manual modes.

Autoset uses factory predetermined Wire Feed Speed and Voltage settings to make welding easier. The user can simply choose the Material Type, Wire Diameter, Gas Type (there are different Shielding gases depending on material chosen), Joint Type, and lastly the Plate thickness. Once those parameters have been selected, the factory Synergic lines are loaded into the machine and you are ready to weld for the given plate thickness.

Once in the welding screen the user has the ability to "Trim" the Voltage setting up or down to fine tune the weld if required.

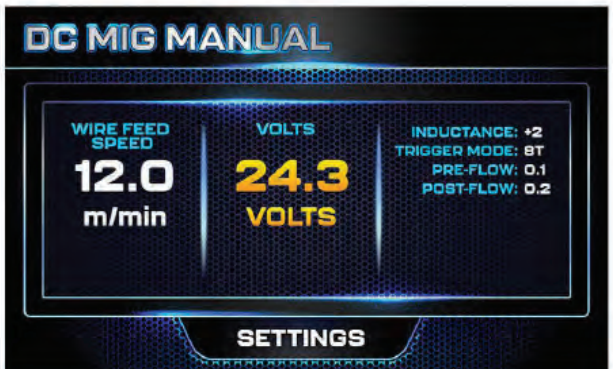
Manual Mode is the traditional Wire Feed Speed and Voltage selection in which the user must set their parameters manually to obtain the correct wire speed and voltage.

From the Home Screen using the Left Control Knob select DC MIG then using the Left Control Knob, press to select.

- Using the Left hand Control Knob, select DC MIG

- Using the Left hand Control Knob, select DC MIG Autoset or Manual.

- Use the Left hand Control Knob to control Wire Feed Speed.
- Use the Right hand Control Knob to control Volts.



Single Pulse MIG Selection

The BlueVenom XF210⁶ has Single Pulse MIG Autoset mode.

Single Pulse Autoset mode uses factory predetermined Wire Feed Speed and Voltage settings to make welding easier. The user can simply choose the Material Type, Wire Diameter, Gas Type (there are different Shielding gases depending on material chosen), Joint Type and lastly the Plate thickness. Once those parameters has been chosen, the factory Synergic lines are loaded into the machine are and you are ready to weld for the given plate thickness.

Once in the welding screen the user has the ability to "Trim" the Voltage setting up or down to fine tune the weld if required.

From the Home Screen using the Left Control Knob highlight MIG Single Pulse then press the Left Control Knob to make selection.

Double Pulse MIG Selection

The BlueVenom XF210⁶ has Double Pulse MIG Autoset mode.

Double Pulse Autoset mode uses factory predetermined Wire Feed Speed and Voltage settings to make welding easier. The user can simply choose the Material Type, Wire Diameter, Gas Type (there are different Shielding gases depending on material chosen), Joint Type and lastly the Plate thickness. Once those parameters has been chosen, the factory Synergic lines are loaded into the machine are and you are ready to weld for the given plate thickness.

Once in the welding screen the user has the ability to set Base current (as a % of Peak Current), Pulse Width, Pulse Frequency, and Trim the Voltage setting up or down to fine tune the weld if required and to get TIG Dime looking welds.

From the Home Screen using the Left Control Knob highlight MIG Double Pulse then press the Left Control Knob to make selection.

Autoset MIG Modes Settings Overview

Gun/Remote

The settings allows the user to select either MIG Gun or Spool Gun operation.

Material Type

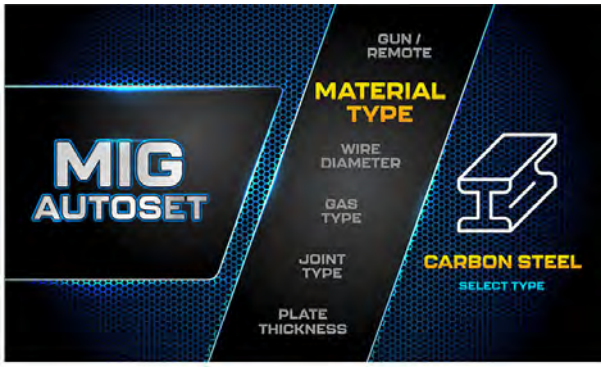
This Setting allows the user to select the material they are welding. Available options are:

DC MIG:

Mild Steel Gas, Mild Steel Gasless, Mild Steel FCAW, Stainless Steel, Hard Facing, Silicon Bronze.

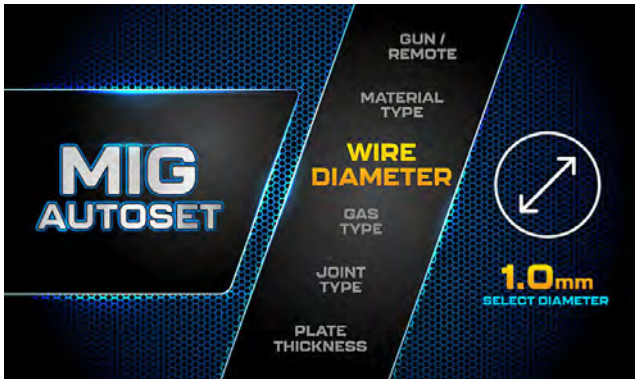
Single and Double Pulse:

Mild Steel, Stainless Steel, Silicon Bronze, 5356 Aluminium, 4043 Aluminium.



Wire Diameter

This Setting allows the user to select the Wire Diameter they are using. The available options are dependent on the material they are welding.



Gas Type

This Setting allows the user to select the Gas they are using. The available options are dependent on the material they are welding. Mild Steel materials have two options available, whereas the other materials only have one gas type to choose.

The Gas Types available are:
Ar 90% + CO2 10%, Ar 82% + CO2 18%, Ar 100% and Ar 98% + CO2 2%.

Joint Type

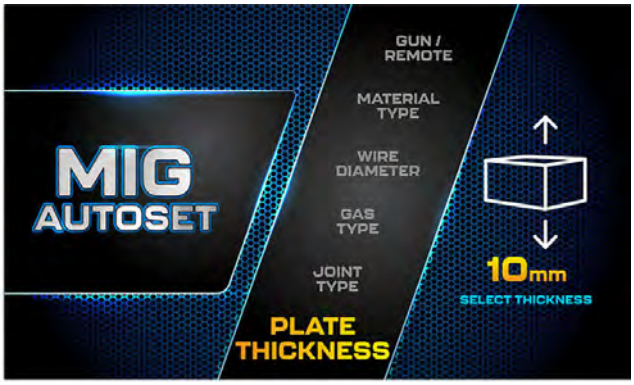
This Setting allows the user to select the Joint Type they are welding. Different Joint Types require different parameters, so selecting the correct Joint type helps achieve optimal results.

Joint Types available are:
Fillet Weld, Butt Weld, Lap Joint and Corner Weld.
Please note Plate thickness are limited on Butt Weld.

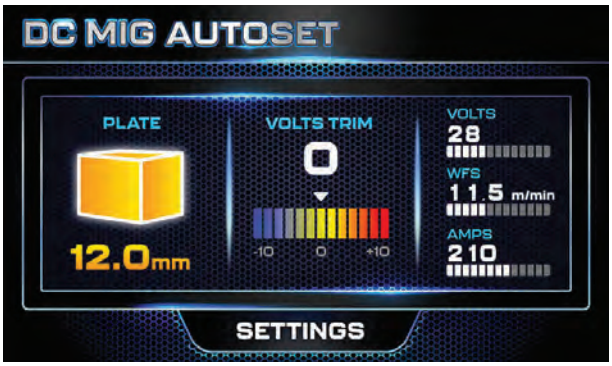
Plate Thickness

The Plate thickness setting allows the user to choose the thickness of the material they are welding to achieve the correct Factory Voltage and Wire Feed Speed settings.

They can be adjusted in this screen, and/or in the welding screen.



Autoset Plate Thickness



Select Plate Thickness and Autoset will set factory Synergic values for Voltage, Current (Amps) and Wire speed.

With Autoset Settings installed the guess work is now taken out of the setup, to allow excellent welding results. All you need to set is the Material Type, Wire Diameter, Shielding Gas Type, Joint type and Plate Thickness.

Autoset Plate thickness setting allows you to set up in a flash. There is no guessing the welding parameters, use the Autoset feature to set the machine to the correct plate thickness you are welding.

You can check the plate thickness with a measuring device, such as a ruler or vernier caliper. If two different plate thickness are to be joined then, add the two together and divide by 2 and use the average plate thickness as your setting guide.

Volts Trim

If in MIG Autoset mode and the weld is not quite to the user's desire, the Volts trim function can be used. Volts trim allows the user to alter the voltage to a higher, or lower setting than the factory Synergic line. Rotating the Right Control Knob will adjust Volts Trim.

For example, if the Pre-set Voltage is 20V and in volts trim mode the setting is changed to -10 then the Pre-set voltage will now be 15V. If the Volts Trim is changed to +10.0 then the Pre-set Voltage will be 25V.

Volts Trim has a range of -10 to +10, in increments of 0.5V, or +/- 5 volts in total.

If the value has been changed, to return to the factory parameters simply return the Volts Trim setting to display 0 which is the Factory Synergic Voltage Value.

NOTE: Volts Trim is not available in DC MIG Manual mode.

NOTE: Depending on the material thickness this may limit the Volts trim values available.

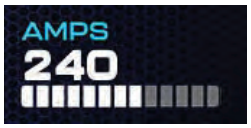
Volts Display

Displays the Preview Voltage based on Autoset factory parameters for set Plate Thickness.

Wire Feed Speed (m/min)

Displays MIG wire feed speed in metres per minute (m/min) based on Autoset factory parameters for set Plate Thickness.

Current (Amps)



Welding Current (AMPS) is not able to be set independently in Synergic Modes. The setting value shown represents an average for the set welding conditions, as preview for the operator.

Settings

Joint Type

This Setting allows the user to select the Joint Type they are welding. Different Joint Types require different parameters, so selecting the correct Joint type helps achieve optimal results.

Joint Types available are: Fillet Weld, Butt Weld, Lap Joint and Corner Weld. Please note Plate thickness are limited on Butt Weld.

Gun Type

The Gun Type is used to select the type of Gun being used. Select either MIG Gun or Spool Gun using the Right Hand Control Knob. Once set exit Advanced Settings by pressing the Back Button.

Trigger Mode

Enter Advanced settings and cycle through the settings until reaching Trigger Mode (It will highlight). Use the Right Control Knob to adjust to the desired mode.

The Trigger Mode control is used to switch the functionality of the MIG Gun trigger between 2T (normal) and 4T (latch mode).

2T Normal Mode

In this mode, the MIG Gun trigger must remain depressed for the welding output to be active. Press and hold the MIG Gun trigger to activate the power source (weld). Release the MIG Gun trigger switch to cease welding.

4T Latch Mode

This mode of welding is mainly used for long welding runs to reduce operator fatigue. In this mode the operator can press and release the MIG Gun trigger once welding has commenced and the output will remain active. To deactivate the power source, the MIG Gun trigger switch must again be depressed and released, thus eliminating the need for the operator to hold the MIG Gun trigger.

NOTE

If Spot Weld Time is ON, 2T is only available and 4T is unable to be selected. If you are unable to select 4T mode, it is likely that Spot Weld Time is not set to 0.0s

Spot Weld Time

Spot welding is used to weld two thin plates together at a desired location by melting the top and bottom plates together to form a nugget between them.

Operates in Trigger 2T mode only. Enter Advanced settings and cycle through the settings until reaching Spot Weld Time (It will highlight). Use the Right Control Knob to adjust to the desired time.

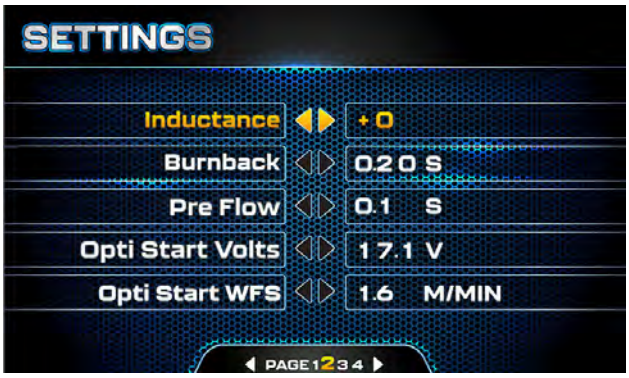
This parameter has an adjustment range of 0 – 5.0 seconds. Factory setting for Spot Time is 0 seconds. Once set exit Advanced Settings by pressing the Back Button.

Creep Feed Speed

Creep Feed is the Wire Feed Speed prior to the arc striking. It allows the user to set the initial wire feed speed to a desired speed.

Enter Advanced settings and cycle through the settings until reaching Creep Feed Speed (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 1.0 – 4.0min. Factory setting for Creep Feed Speed is 4.0m/min. Once set exit Advanced Settings by pressing the Back Button.



Inductance

The Inductance (arc) control operates in MIG (GMAW) modes only and is used to adjust the intensity of the welding arc. Lower arc control settings make the arc softer with less weld spatter. Higher arc control settings give a stronger driving arc which can increase weld penetration.

Enter Advanced settings and cycle through the settings until reaching Inductance (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of +10 to -10. Factory setting for Inductance is 0. Once set exit Advanced Settings by pressing the Back Button.

Burnback

Burnback Control is used to adjust the amount of MIG wire that protrudes from the MIG Gun after the completion of MIG welding (commonly referred to as stick out).

Enter Advanced settings and cycle through the settings until reaching Burnback (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 0.05 - 0.4 seconds. Factory setting for Burnback is 0.2 seconds. Once set exit Advanced Settings by pressing the Back Button.

Pre Flow

Pre Flow is a short burst of shielding gas prior to the arc initiating. The short burst of gas reduces the risk of weld contamination at the start of the weld.

Enter Advanced settings and cycle through the settings until reaching Pre Flow (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 0.0 – 1.0 seconds. Factory setting for Pre Flow is 0.1 seconds. Once set exit Advanced Settings by pressing the Back Button.

Opti Start Volts

The Opti Start Volts is used to improve the start characteristics in MIG mode by increasing or decreasing the starting voltage for a user defined time frame. It performs the same as hot start.

Enter Advanced settings and cycle through the settings until reaching Opti Start Volts (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 10V – 28V seconds. Factory setting for Opti Start Volts is 28.0 Volts. Once set exit Advanced Settings by pressing the Back Button.

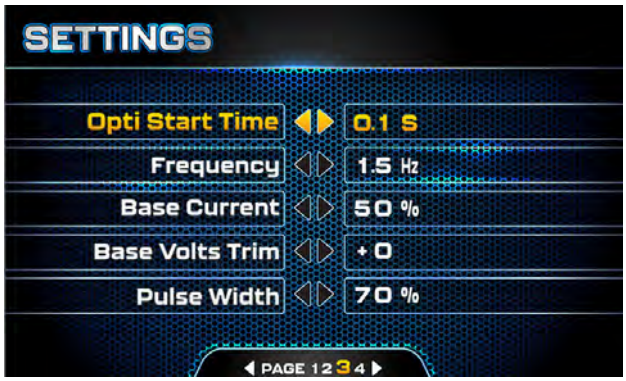
Opti Start WFS

The Opti Start WFS is used to improve the start characteristics in MIG mode by increasing or decreasing the starting wire feed speed for a user defined time frame.

Opti Start WFS increases/decreases the Wire Feed Speed separately from the pre-set WFS for a user defined period of time, which punches more wire into the arc and provides better penetration and higher amperage at the start.

Enter Advanced settings and cycle through the settings until reaching Opti Start WFS (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 1.5m/min to 15.0m/min. Factory setting for Opti Start WFS is 15.0m/min. Once set exit Advanced Settings by pressing the Back Button.



Opti Start Time

The Opti Start Time is the setting that determines how long the Opti Start settings will run for.

Enter Advanced settings and cycle through the settings until reaching Opti Start Time (It will highlight). Use the Right Control Knob to adjust to the desired value.

This parameter has an adjustment range of 0.1 – 3.0 seconds. Factory setting for Opti Start Time is 3.0 seconds. Once set exit Advanced Settings by pressing the Back Button.

Frequency (Pulse Speed)

Only available in Double Pulse MIG Modes.

Frequency is the number of times per second that a pulse (also known as cycle) will take place. The unit of measurement is Hertz (Hz). A Pulse cycles between a Pulse Base current (bottom of the pulse) and the Peak Current (top of the pulse). This allows you to control the overall heat input, maintain arc stability and have a better looking weld by improving control over the weld pool. Higher frequencies result in more rapid cycling between the two current levels. As an example, if the Pulse Frequency is set for 2.4Hz, you will observe 2.4 pulses per second (almost 10 pulses every 5 seconds).

Enter the Settings Screen and cycle through the settings until reaching Frequency (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 0.3 – 5Hz. Factory setting is 1.2Hz in this mode. Once set exit Advanced Settings by pressing the Back Button.

Base Current (%)

Only available in Double Pulse MIG Modes.

Base Current is the bottom current (set as a percentage) of the Peak Current that your Pulse Cycle will have. It helps maintain the arc stability and keeps the weld pool in a controlled state while minimizing heat input. The base current is set at a lower value compared to the peak current. For example, if a Pulse Base Current of 40% is set, the variation will be 60% between Peak and Base. If you increase the Base Current percentage to 60% this will make the weld hotter (provide more average current), conversely if you have a low base percentage the average weld current will be colder.

The higher the percentage, the hotter the weld, the lower the percentage, the colder the weld.

Enter the Settings Screen and cycle through the settings until reaching Base Current (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 20 – 99%. Factory setting for Base Current 50%. Once set exit Advanced Settings by pressing the Back Button.

Base Volts Trim

Only available in Double Pulse MIG Modes.

If in Double Pulse MIG Mode and the Base Current needs some slight adjustments to suit the user's desire, the Base Volts trim function can be used. Base Volts trim allows the user to alter the voltage to a higher, or lower setting than the set Base Current while maintaining the same Wire Feed Speed, which essentially can change the arc length in between Pulses.

Base Volts Trim has a range of -10 to +10, in increments of 0.5V, or ± 5 volts in total.

If the value has been changed, to return to the factory parameters simply return the Base Volts Trim to 0

Enter the Settings Screen and cycle through the settings until reaching Base Volts Trim (It will highlight). Use the Right Control Knob to adjust to the desired level.

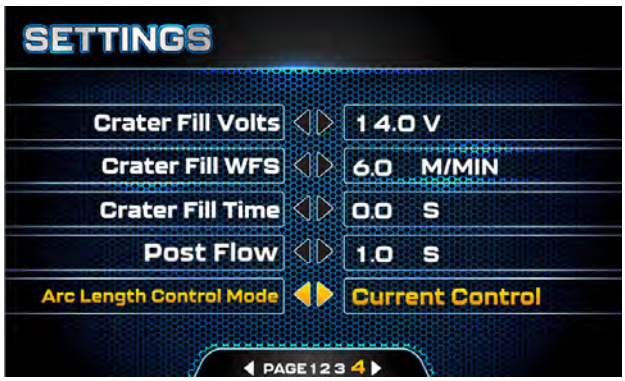
Pulse Width (Ripple Gap)

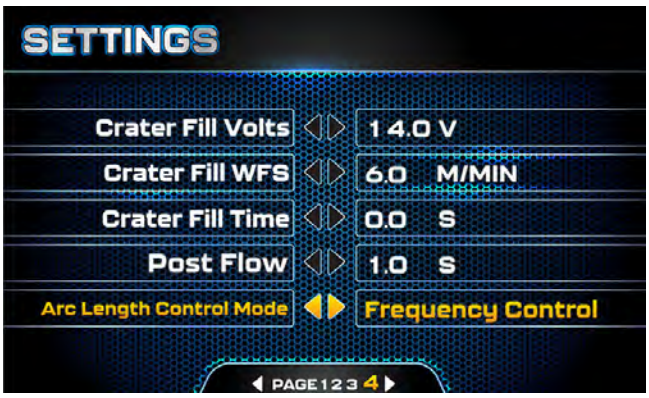
Only available in Double Pulse MIG Modes.

The Pulse Width, also known as Pulse Duration or Ripple Gap, refers to the length of time the current remains at the peak level before returning to the base level. It is usually expressed as a percentage of the total cycle time. A shorter pulse width results in less heat input and narrower weld beads, while a longer pulse width provides more heat and wider weld beads. Put it simply, it refers to the duration of the "on" and "off" periods of the welding current during each pulse.

Enter the Settings Screen and cycle through the settings until reaching Frequency (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 20 – 80%. Factory setting for Pulse width is 70%. Once set exit Advanced Settings by pressing the Back Button.





Crater Fill

The Crater Fill Function reduces the Welding Current (Wire Feed Speed and Voltage) at the end of the weld over a user set period of time. This allows the user to fill and finish the end of the weld, eliminating craters from the weld. Craters at weld ends can be a starting point for cracking.

Crater Fill Volts

Crater Fill Voltage is used to set the finishing voltage for MIG.

Enter the Settings Screen and cycle through the settings until reaching Crater Fill Volts (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 10.0 - 28.0 Volts. Factory setting for Crater Fill Voltage is 28.0 Volts. Once set exit Advanced Settings by pressing the Back Button.

Crater Fill WFS

Crater Fill Wire Feed Speed is used to set the finish wire feed speed for MIG.

Enter the Settings Screen and cycle through the settings until reaching Crater Fill WFS (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 1.5 - 15m/min. Factory setting for Crater Fill WFS is 4.0m/min. Once set exit Advanced Settings by pressing the Back Button.

Crater Fill Time (CFT)

Crater Fill Time is the time in seconds that the Crater Fill parameters ramp down to achieve Crater Fill finish at the end of the weld.

Press the Menu Button then the Forward and Back Menu Arrow Buttons to cycle through the Advanced Settings until reaching Crater Fill Time (CFT). Once selected use the Right Control Knob to set the desired value.

This parameter has an adjustment range of 0.1 – 9.9 seconds.Factory setting for Crater Fill Time is 0.5 seconds. Once set exit Advanced Settings by pressing the Menu Button.

Post Flow

Post Flow setting is for shielding gas that will continue to flow after the weld has been completed, to shield the molten pool from the atmosphere. This reduces the likelihood of the weld being contaminated.

Press the Menu Button then the Forward and Back Menu Arrow Buttons to cycle through the Advanced Settings until reaching Post Flow (It will highlight). Use the Right Control Knob to adjust to the desired level.

This parameter has an adjustment range of 0.1 - 2.0 seconds. Factory setting for Post Gas is 0.1 seconds. Once set exit Advanced Settings by pressing the Back Button.

Arc Length Control

(Pulse MIG and Double Pulse MIG modes only)

In most applications Frequency Control Arc Length Mode is recommended however for thinner plates Current Control Arc Length Mode may be preferred.

Enter the Settings Screen and cycle through the settings until reaching Arc Length Control Modes (It will highlight). Use the Right Control Knob to adjust to the desired setting.

Current Control Arc Length Mode

In Arc Length Current Control Mode the arc length is maintained by automatically adjusting the welding current. For a high arc voltage (thicker plate) the welding current decreases. For a low arc voltage (thinner plate) the welding current increases.

This control mode is best suited when welding in Single Pulse MIG Mode so that the Pulse Frequency can be adjusted independently from the Arc Length setfrequency increases.

Frequency Control Arc Length Mode

In Frequency Control Arc Length Mode the arc length is maintained by automatically adjusting the pulse frequency. For a high arc voltage (thicker plate) the pulse frequency decreases. For a low arc voltage (thinner plate) the pulse frequency increases.

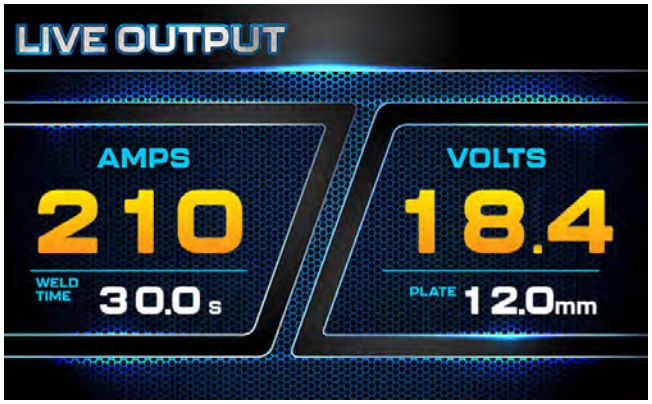
This control mode is best suited when welding in Double Pulse MIG Mode.

NOTE

The Pre-set functionality provided on this power source is intended to act as a guide only. Some differences may be observed between pre-set values and actual welding values due to factors including the mode of welding, differences in consumables/gas mixtures, individual welding techniques and the transfer mode of the welding arc (ie dip versus spray transfer). Where exact settings are required (in the case of procedural work), it is recommended that alternate measurement methods be utilised to ensure output values are accurate.

Live Output Screen

While welding, the Live Output screen displays actual machine output including Amperage, and Voltage which will fluctuate due varying factors. Once welding has ceased, the Live Output screen will display the average Amperage, Voltage and Weld Duration for approximately 10 seconds, or until recommencing welding, or the control knobs are pressed/rotated.



Pulse in welding

Pulse has a growing relevance in the welding industry, as it allows operators to achieve great results with less effort. To better comprehend the concept we will examine the 4 main components of the Pulse concept, applied to a welding scenario.

Why is it such a big deal?

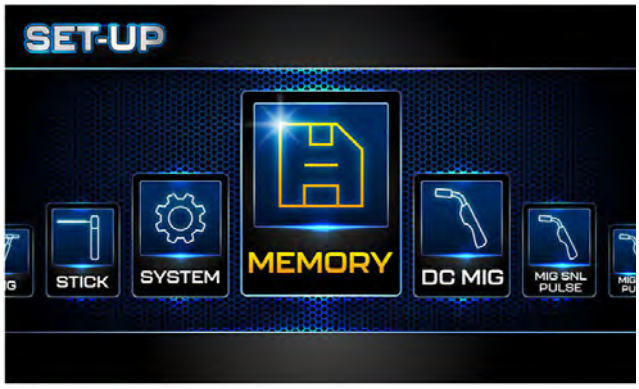
When the pulse function is enabled, the welding current alternates between the base and peak levels according to the set frequency and pulse duration. This pulsing of the current offers several benefits:

1. Heat control: By alternating between higher and lower currents, the pulse function allows for better control over the heat input. The peak current generates more heat, allowing for good fusion and penetration into the base metal, while the base current helps reduce heat buildup, minimizing the risk of distortion or burn-through.
2. Arc stability: Pulsing the current helps to maintain a stable welding arc, especially when welding thin materials or in challenging positions. The rapid cycling between the two current levels can aid in arc control and reduce spatter.
3. Improved control over weld pool: The pulsing action provides better control over the molten weld pool, allowing the welder to manipulate its shape and size. This control is particularly useful for achieving desired bead appearance, controlling the width of the weld, and filling gaps more effectively.
4. Reduced heat-affected zone (HAZ): The pulse function helps limit the size of the heat-affected zone, which is the area surrounding the weld that undergoes thermal changes. This can lead to less distortion, reduced warping, and minimise metallurgical changes in the base metal.

By utilizing the pulse function in MIG welding, welders can achieve improved weld quality, better control over the process, and enhanced productivity, especially when working with challenging materials or in demanding welding applications.

Memory Function

The BlueVenom XF210⁶ has 60 memory locations for saving your favourite jobs. These can range from common jobs you perform, to jobs with custom parameters.



Memory Save

While in the welding screen, to save the welding parameters, long press the forward button .

This will then enter the memory Save screen. Using the Left Control Knob, highlight JOB.

Using the Right Hand Control Knob, rotate to Job number you would like to save the parameters in. Once you have chosen the Job number you would like to save the parameters in, Rotate The Left Hand Control Knob until Save? Highlights, then depress to save.

Memory Overwrite

If parameters have been slightly altered and you would like to save over the existing memory, using the above steps to access the saved memory, go to the relevant job number, and instead of showing SAVE?, it will show OVERWRITE?

Using the Right Control Knob, highlight and depress. A warning will appear, rotate and select YES.

Memory Load

To Load a saved memory, long press the forward (insert forward arrow>). Button while in the HOME screen. This will then enter the memory Load screen. Using the Left Control Knob, highlight JOB and select the number you would like to Load using the Right Had Control Knob. All parameters will be shown on the Right Hand side of the screen.

Using the Left Hand Control Knob, rotate to highlight LOAD, depress to select. Your memory settings will now be loaded.

5.10 MIG AUTOSET VERSUS MIG MANUAL

AutoSet MIG Mode in 6 Steps

With AutoSet Pre-Sets installed the guess work is now taken out of the setup, to allow excellent welding results. All you need to set is the MIG Gun Type, Material type, MIG Wire Diameter, Shielding Gas Type, Joint Type and Plate Thickness.

Plate thickness setting allows you to set up in a flash. There is no guessing the welding parameters. Use the AutoSet feature to set the machine to the correct plate thickness you are welding. You can check the plate thickness with a measuring device, such as a ruler or vernier caliper. If two different plate thickness are to be joined then, add the two together and divide by 2 and use the average plate thickness as your setting guide.

Manual MIG Mode

In Manual MIG Mode, Voltage and WFS (Wire Feed Speed) must be manually set.

5.11 MIG GUN POLARITY LEAD

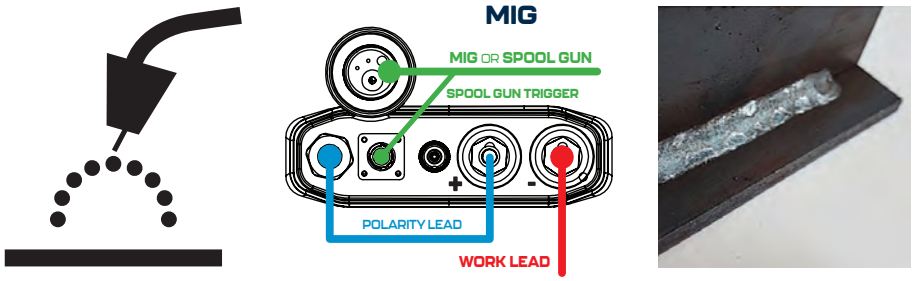
Changing MIG Gun Polarity in MIG Mode.

The MIG Gun Polarity Lead is located on the front of the machine. It can be connected to either of the Positive (+) or Negative (-) Output Terminals by inserting the twist connector into the appropriate panel socket, tightening it clockwise.

These terminals determine the polarity of the MIG Gun and the Work Lead connection.

MIG Gun Polarity Lead Connection for Solid MIG Wire with Shielding Gas.

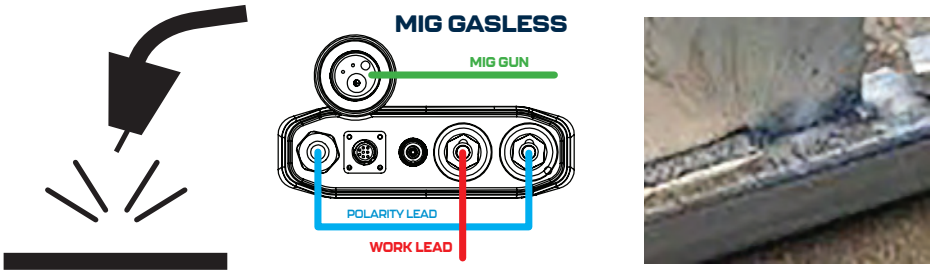
1. The MIG Gun Polarity Lead must be connected to the Positive (+) Terminal on the front of the power source. This makes the MIG Gun electrode positive, which supplies 2/3 heat to the welding wire and weld deposit. Polarity electrode/wire Positive (+).



2. The Work Return cable and clamp must be connected to the negative (-) terminal by inserting the twist connector into the front panel socket and then tighten it clockwise. Connect the clamp to the work piece.

MIG Gun Polarity Lead Connection for Gasless Flux Cored MIG Wire.

1. The MIG Gun Polarity Lead must be connected to the Negative (-) Terminal on the front of the Power Source as shown. This makes the MIG Gun electrode negative, which supplies 1/3 heat to the welding wire and weld deposit. Polarity electrode/wire Negative (-)



2. The Work Return cable and clamp must be connected to the positive (+) terminal by inserting the twist connector into the front panel socket and then tighten it clockwise. Connect the clamp to the work piece.

5.12 GAS MIG (GMAW) SOLID WIRE SETUP

A. Ensure that the Power Source On/Off switch located on the rear of the Power Source is in the Off position.

B. Fit the MIG Gun to the Power Source. (Refer to section 5.02 Attaching the MIG Gun).

C. Connect the MIG Gun Polarity (8) to the positive welding terminal (+). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male DINSE plug is inserted and turned securely to achieve a sound electrical connection.

D. Fit the correct Feed Roll for the Gas Shielded MIG wire being used. Refer to section 2.11 Options and Accessories for Feed Roll types and Part Numbers.

E. Place the MIG wire spool onto the spool holder. Refer to sections 5.04 for 100/200mm diameter spools.

F. Switch the Power Source On/Off switch located on the rear of the Power Source to the On position and ensure the Front Display is illuminated.

G. Select the Gas Shielded MIG Mode for the application. Refer to Section 5.10 for details.

H. Feed wire through the wire drive mechanism. Refer to section 5.07.

I. Connect the work lead to the negative welding terminal (-). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.

J. Fit the welding grade shielding Gas Regulator/Flowmeter to the shielding gas cylinder. Ensure that the shielding gas hose connection is sufficiently tight at the regulator connection. Refer to section 5.01 for the connection and instruction of shielding Gas Regulator/Flowmeter.

NOTE

Power Source settings are adjusted using the front panel controls. Refer to section 5.10.

WARNING

Before connecting the work clamp to the work piece make sure the mains power supply is switched off.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the terminal. Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

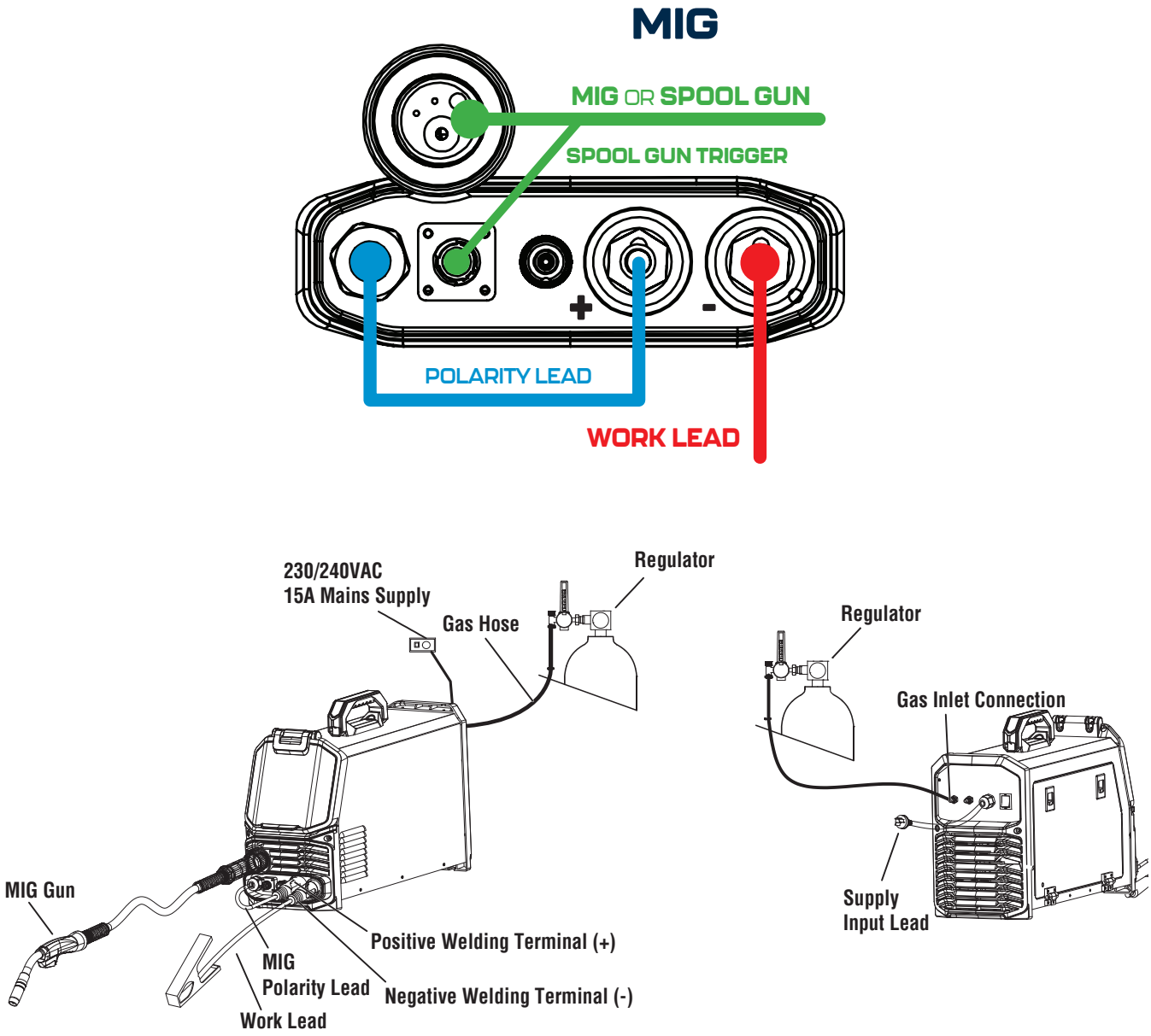


Figure 5-15: Setup for MIG Welding with Gas Shielded MIG Wire

5.13 GASLESS MIG (FCAW) WELDING WITH FLUXCORED WIRE

A. Ensure that the Power Source On/Off switch located on the rear of the Power Source is in the Off position.

B. Fit the MIG Gun to the Power Source. (Refer to section 5.02 Attaching the MIG Gun).

C. Connect the MIG Gun Polarity (8) to the negative welding terminal (-). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male DINSE plug is inserted and turned securely to achieve a sound electrical connection.

D. Fit the correct Feed Roll for the Gasless MIG wire being used. Refer to section 2.11 Options and Accessories for Feed Roll types and Part Numbers.

E. Place the MIG wire spool onto the spool holder. Refer to sections 5.04 for 100/200mm diameter spools.

F. Switch the Power Source On/Off switch located on the rear of the Power Source to the On position and ensure the Front Panel Display is illuminated.

G. Select DC MIG Mild Steel Gasless Mode. Refer to Section 5.10 for details.

H. Feed wire through the wire drive mechanism. Refer to section 5.07.

I. Connect the work lead to the positive welding terminal (+). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.

WARNING

Moving Parts can cause injury!

WARNING

Before connecting the work clamp to the work piece make sure the mains power supply is switched off.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the terminal.

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

NOTE

AutoSet wire sizes for MIG GASLESS (Flux Cored Wire) are 0.8mm and 0.9mm diameter.

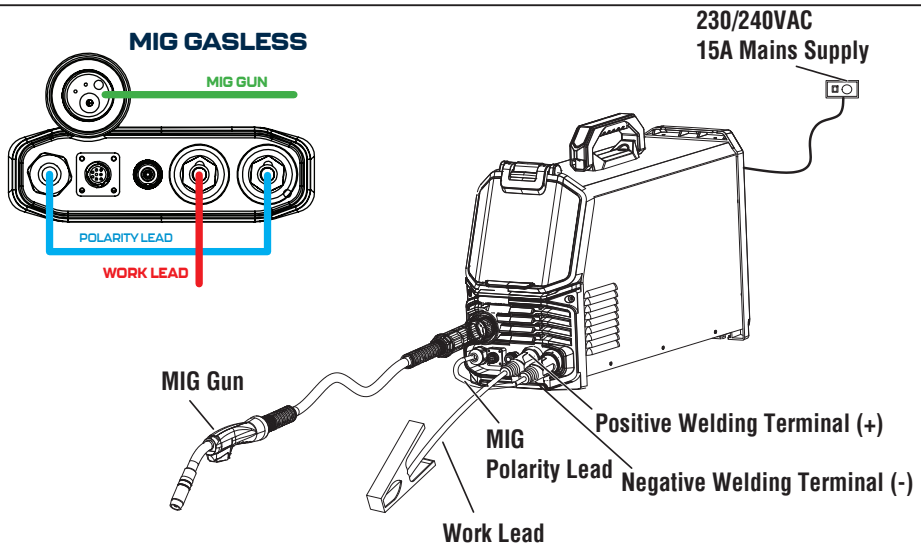


Figure 5-16: Setup for MIG Welding with Gasless MIG Wire

5.14 SPOOL GUN MODE WITH GAS SHIELDED MIG WIRE

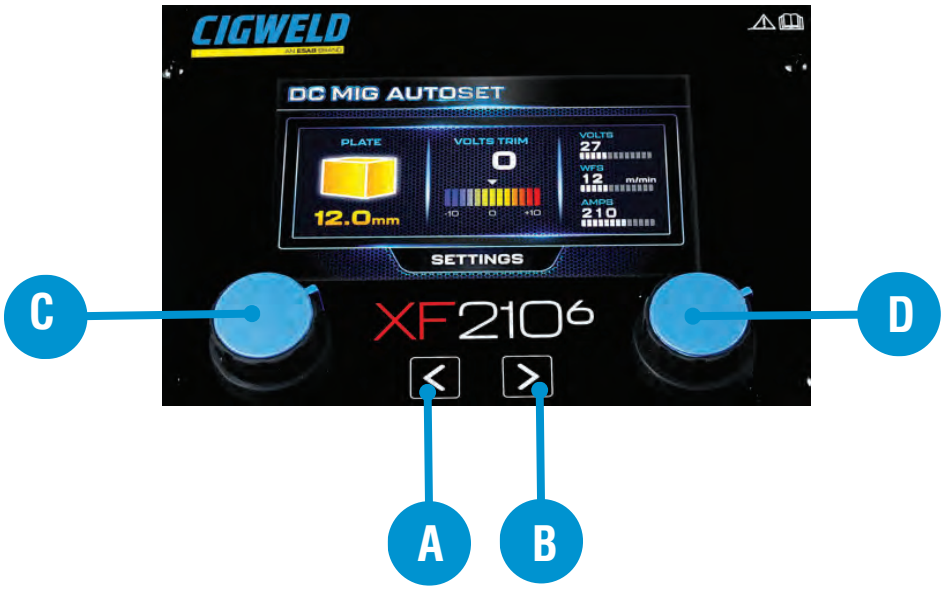


Figure 5-17: MIG (GMAW) Mode And Setup With Spool Gun For Gas Shielded MIG Wire

Spool Gun Mode

The BlueVenom XF210⁶ can run a Spool Gun in all MIG modes – DC MIG Manual and synergic in DC MIG Autoset, Single Pulse and Double Pulse. Yes that's right, with the XF210⁶ you can run a Spool Gun in Single and Double Pulse modes with adjustable Plate Thickness adjustments on the Spool Gun!

Using a Spool Gun not only allows you to have a longer distance between the power source and the job you are welding, with the shorter distance between the MIG wire spool and contact tip, there will be smoother wire feed speeds leading to less feedability issues. A Spool Gun is perfect for those occasions when you need the 6m long power cable to get to those hard-to-reach places and jobs that require softer wires such as 4043 aluminium.

In Autoset modes Spool gun mode selection can be chosen via Autoset Wizard Screen under the Gun/Remote selection, alternatively under the Settings Screen located on the Weld screen.

In DC Manual Mode the Spool Gun selection must be done in the settings screen.

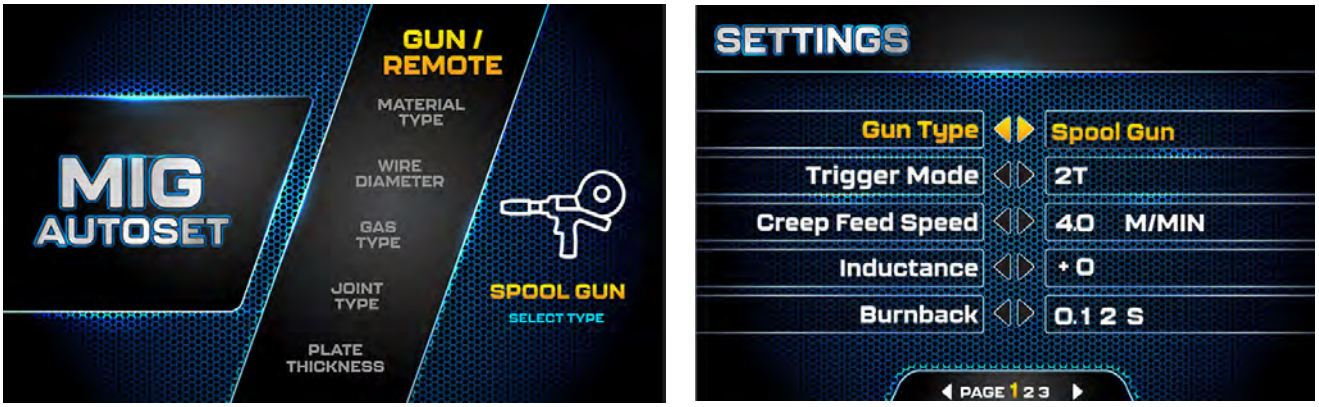


Figure 5-18: MIG Spool Gun Mode

Spool Gun Setup

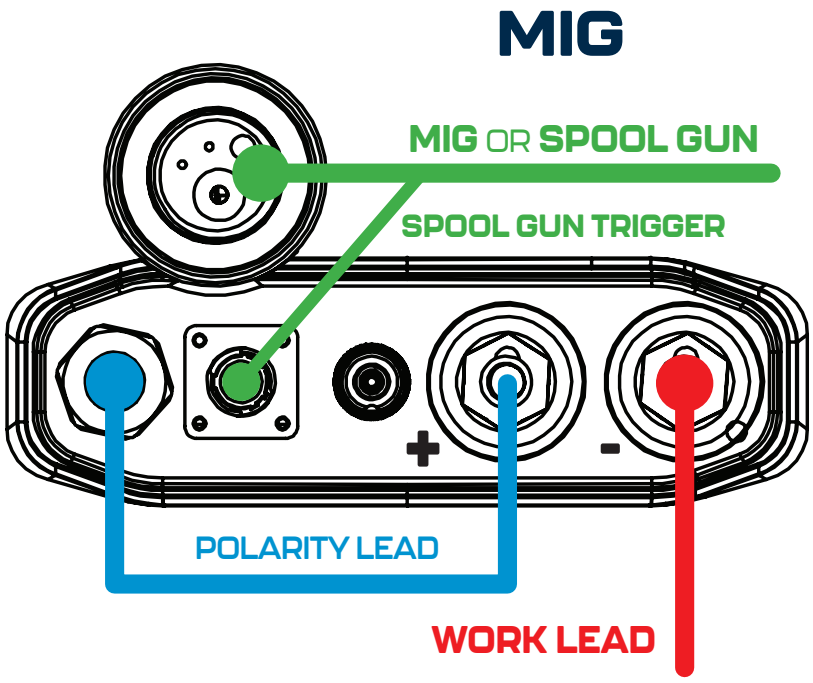
- Ensure that the Power Source On/Off switch located on the rear of the Power Source is in the Off position.
- Fit the Euro Spool Gun to the Power Source using the front panel EURO torch adaptor (refer also to section 5.02 Attaching the MIG Gun). Connect the 8 pin Remote Control Plug to the 8 pin Remote Control Socket on the power source. Ensure 8 pin plug is correctly fitted to the 8 pin socket on front panel and collar on plug is tightened firmly.
- Connect the MIG Gun Polarity (8) to the positive welding terminal (+). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male DINSE plug is inserted and turned securely to achieve a sound electrical connection.
- Fit the correct Feed Roll in Spool Gun for the Gas Shielded MIG wire being used.
- Switch the Power Source On/Off switch located on the rear of the Power Source to the On position and ensure Front Panel is illuminated.
- Select MIG Spool Gun Mode. Refer to Section 5.14 for further information.
- Feed wire through the wire drive mechanism in the Spool Gun.
- Connect the work lead to the negative welding terminal (-). If in doubt, consult the wire manufacturer. Welding current flows from the Power Source via DINSE terminals. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.
- Fit the welding grade shielding Gas Regulator/ Flowmeter to the shielding gas cylinder. Ensure that the shielding gas hose connection is sufficiently tight at the regulator connection. Refer to section 5.01 for the connection and instruction of shielding Gas Regulator/Flowmeter.

WARNING

Before connecting the work clamp to the workpiece make sure the mains power supply is switched off.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the terminal. Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.



NOTE

If Spool gun is required to Weld using Gasless MIG Wire, the appropriate feed Roll is required, and polarity reversal. Refer to section 5.13 for setup.

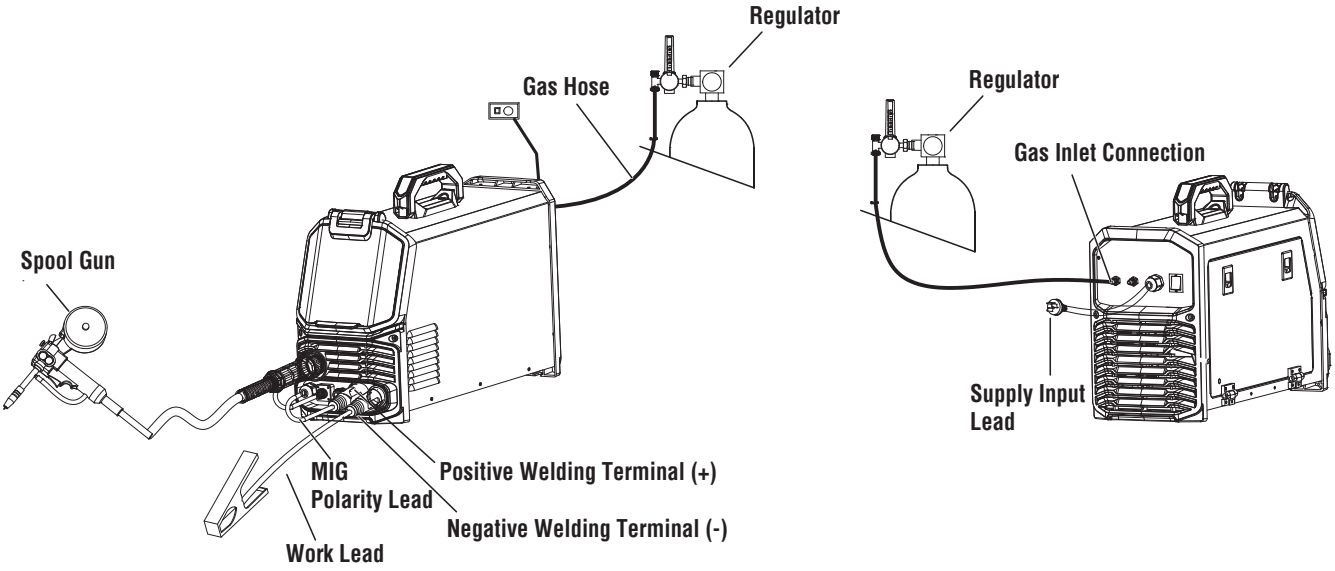


Figure 5-19: Setup with Spool Gun for Gas Shielded MIG Wire

SETTING OF THE POWER SOURCE

Power source setting requires some practice by the operator, (however with the AutoSet feature of the BlueVenom XF210⁶, setting up the correct parameters is a very simple procedure - refer to section 5.10 and 5.11), as the welding plant has two control settings that have to balance. These are the Wire Feed Speed control and the welding Voltage Control. The welding current is determined by the Wire Feed Speed control, the current will increase with increased Wire Feed Speed, resulting in a shorter arc. Less Wire Feed Speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level

When changing to a different MIG wire diameter, different control settings are required. A thinner electrode wire needs more Wire Feed Speed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wire Feed Speed and Voltage settings are not adjusted to suit the MIG wire diameter and the thickness of the work piece.

If the Wire Feed Speed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wire Feed Speed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound.

MIG WIRE SIZE SELECTION

The choice of MIG wire size and shielding gas used depends on thew following:

- Thickness of the metal to be welded
- Type of joint
- Capacity of the wire feed unit and Power Source
- The amount of penetration required
- The deposition rate required
- The bead profile desired
- The position of welding
- Cost of the wire

5.15 CIGWELD MIG WIRE SELECTION CHART

BLUEVENOM XF210⁶ MIG WELDING WIRE SELECTION CHART

DESCRIPTION	CLASS. AUS/ NZ STD (NEW)	CLASS. AWS STD	DIA.	PACK	PART NO	APPLICATION
Weldskill Solid Welding Wire	B G 49A 3U C1/ M21/M24 S6	ER70S-6	0.6mm	Mini Spool 0.9kg	WS0906	General purpose solid welding wire suitable for the all positional Gas Metal Arc Welding (GWAW) of mild and low alloy steels, used in general fabrication and for welding of light to medium gauge sheet and tubular steel sections. Please Note: A suitable shielding gas is required.
			0.6mm	Handi Spool 5kg	WS5006	
			0.8mm	Mini Spool 0.9kg	WS0908	
			0.8mm	Handi Spool 5kg	WS5008	
			0.9mm	Mini Spool 0.9kg	WS0909	
			0.9mm	Handi Spool 5kg	WS5009	
Weldskill Gasless Welding Wire	B T 49 Z T11 1 NA	E71T-11	0.8mm	Mini Spool 0.9kg	WG0908	WeldSkill Gasless wire is an all positional self-shielded tubular flux cored wire recommended for single and multi-pass welding applications. It is excellent for lap, fillet and butt welding of thin gauged galvanised and mild steels. The resultant welds have a full coverage easy to scrape-off thin slag covering.
			0.8mm	Handi Spool 4.5kg	WG4508	
			0.9mm	Mini Spool 0.9kg	WG0909	
			0.9mm	Handi Spool 4.5kg	WG4509	
Autocraft 316LSi Solid Stainless Steel MIG Wire	B SS316LSi	ER316LSi	0.8mm	Mini Spool 1kg	721285	General purpose all positional solid stainless steel wire providing excellent results when used with correct shielding gas. Suitable for the general welding of a wide range of stainless steels (300 & 400 series). Please Note: A suitable shielding gas is required.
			0.8mm	Handi Spool 5kg	720288	
			0.9mm	Handi Spool 5kg	720283	

BLUEVENOM XF210⁶ MIG WELDING WIRE SELECTION CHART

DESCRIPTION	CLASS. AUS/ NZ STD (NEW)	CLASS. AWS STD	DIA.	PACK	PART NO	APPLICATION
Autocraft AL5356 Solid Aluminium MIG Wire	S Al 5356	ER5356	0.9mm	Mini Spool 0.5kg	721223	Excellent general purpose solid Aluminium MIG wire suitable for the welding of a wide range of wrought and cast Aluminium alloys containing Magnesium. Please Note: A suitable shielding gas is required.
			1.0mm	Mini Spool 0.5kg	721224	
			1.0mm	Handi Spool 2.0kg	723224	
			1.2mm	Handi Spool 2kg	720231	
Autocraft Silicon Bronze MIG Wire	--	ERCuSi–A	0.8mm	Handi Spool 5kg	720159	A solid Silicon Bronze wire designed for MIG brazing of most metals. Used for lower strength welding of steels in automotive applications. It can also be used for welding copper-silicon alloys in hot water systems, heat exchangers and marine components. Please Note: A suitable shielding gas is required

Note: Mini Spool = 100mm diameter, Handi Spool = 200mm diameter

Table 5-1: Welding Wire Selection Chart

5.16 MIG (GMAW/FCAW) WELDING TROUBLESHOOTING

SOLVING PROBLEMS BEYOND THE WELDING TERMINALS

The general approach to fix Gas Metal Arc Welding (GMAW) problems is to start at the wire spool then work through to the MIG Gun. There are two main areas where problems occur with GMAW, Porosity and Inconsistent wire feed.

SOLVING PROBLEMS BEYOND THE WELDING TERMINALS - POROSITY

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal. Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points.

	FAULT		CAUSE
1	Shielding gas cylinder contents and flow meter.	**A**	Ensure that the shielding gas cylinder is not empty and the flow meter is correctly adjusted to 15 litres per minute.
		B	Ensure Shielding Gas hose is connected to the MIG gas Inlet quick connect.
2	Gas leaks.		Check for gas leaks between the regulator/cylinder connection and in the gas hose to the Power Source.
3	Internal gas hose in the Power Source.		Ensure the hose from the solenoid valve to the gun adaptor has not fractured and that it is connected to the gun adaptor.
4	Welding in a windy environment.		Shield the weld area from the wind or increase the gas flow.
5	Welding dirty, oily, painted, oxidised or greasy plate.		Clean contaminates off the work piece.
6	Distance between the MIG Gun nozzle and the work piece.		Keep the distance between the MIG Gun nozzle and the work piece to a minimum. Refer to cigweld.com.au for further MIG (GMAW/FCAW) Welding information.
7	Maintain the MIG Gun in good working order.	**A**	Ensure that the gas holes are not blocked and gas is exiting out of the gas diffuser.
		B	Do not restrict gas flow by allowing spatter to build up inside the gun nozzle.
		C	Check that the MIG Gun O-rings are not damaged.

Table 5-2: Welding Terminals- Porosity

WARNING

Disengage the feed roll when testing for gas flow by ear.

Refer to cigweld.com.au for further MIG (GMAW/FCAW) Welding information.

SOLVING PROBLEMS BEYOND THE WELDING TERMINALS - INCONSISTENT WIRE FEED

Wire feeding problems can be reduced by checking the following points:

	FAULT		CAUSE
1	Feed roll driven by motor in the wirefeed compartment slipping.	A	Spool Hub Brake is too tight. (Refer 5.06).
		B	Incorrect feed roll fitted for wire used, or incorrect pressure set on wire feed pressure roller. Check and change to correct feed roll if necessary. (Refer options and accessories table 2.11 for feed roll options)
2	Wire spool unwound and tangled.		Spool Hub Brake is too loose. (Refer 5.06)
3	Worn or incorrect feed roll size.	A	Use a feed roll matched to the size wire you are using.
		B	Replace feed roll if worn.
4	Wire rubbed against the misaligned guides and reduced wire feedability.		Misalignment of inlet/outlet guides.
5	Liner blocked with swarf.	A	Increased amounts of swarf are produced by the wire passing through the feed roll when excessive pressure is applied to the pressure roller adjuster.
		B	Swarf can also be produced by the wire passing through an incorrect feed roll groove shape or size.
		C	Swarf is fed into the conduit liner where it accumulates thus reducing wire feedability.
6	Incorrect or worn contact tip.	A	The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the wire jamming in the contact tip.
		B	When using soft wire such as aluminium it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft wires should be used.
7	Poor work lead contact to work piece.		If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.
8	Bent liner.		This will cause friction between the wire and the liner thus reducing wire feedability.

Table 5-3: Inconsistent Wire Feed

BASIC MIG (GMAW) WELDING TROUBLESHOOTING

FAULT	CAUSE	REMEDY
1 Undercut.	**A** Welding arc voltage too high. **B** Incorrect gun angle. **C** Excessive heat input.	**A** Decrease voltage or increase the Wire Feed Speed. **B** Adjust angle. **C** Increase the gun travel speed and/or decrease welding current by decreasing the voltage or decreasing the Wire Feed Speed.
2 Lack of penetration.	**A** Welding current too low. **B** Joint preparation too narrow or gap too tight. **C** Incorrect shielding gas.	**A** Increase welding current by increasing Wire Feed Speed and increasing voltage. **B** Increase joint angle or gap. **C** Change to a gas which gives higher penetration.
3 Lack of fusion.	Voltage too low.	Increase voltage.
4 Excessive spatter.	**A** Voltage too high. **B** Voltage too low.	**A** Decrease voltage or increase the Wire Feed Speed control. **B** Increase the voltage or decrease Wire Feed Speed.
5 Irregular weld shape.	**A** Incorrect voltage and current settings. Convex, voltage too low. Concave, voltage too high. **B** Wire is wandering. **C** Incorrect shielding gas. **D** Insufficient or excessive heat input.	**A** Adjust voltage and current by adjusting the voltage control and the Wire Feed Speed control. **B** Replace contact tip. **C** Check shielding gas. **D** Adjust the Wire Feed Speed control or the voltage control.
6 Weld cracking.	**A** Weld beads too small. **B** Weld penetration narrow and deep. **C** Excessive weld stresses. **D** Excessive voltage. **E** Cooling rate too fast.	**A** Decrease travel speed. **B** Reduce current and voltage and increase MIG Gun travel speed or select a lower penetration shielding gas. **C** Increase weld metal strength or revise design. **D** Decrease voltage. **E** Slow the cooling rate by preheating part to be welded or cool slowly.
7 Cold weld puddle.	**A** Loose welding cable connection. **B** Low primary voltage. **C** Fault in power source.	**A** Check all welding cable connections. **B** Contact supply authority. **C** Have an Accredited CIGWELD Service Provider to test then replace the faulty component.
8 Arc does not have a crisp sound that short arc exhibits when the Wire Feed Speed and voltage are adjusted correctly.	The MIG Gun has been connected to the wrong voltage polarity on the front panel.	Connect the MIG Gun to the positive (+) welding terminal for most solid wires and gas shielded flux cored wires. Connect MIG Gun to the negative (-) welding terminal for most Gasless Wires. Refer to the electrode wire manufacturer for the correct polarity.

Table 5-4: Welding Troubleshooting

5.17 MIG (GMAW) WELDING PROBLEMS

	PROBLEM		CAUSE		REMEDY
1	Mains Supply Voltage is On, the On/Off switch on the rear panel is in the On position and the Front Control Panel Digital Displays are illuminated however the power source will not MIG weld.	A	Power source is not in the correct mode of operation.	A	Set the power source to MIG mode. Refer to Section 5.10.
		B	MIG Gun Polarity is not connected.	B	Connect the MIG Gun Polarity to the positive or negative output terminal. Refer to Section 4.10.3.
		C	Work Lead is not connected to the work piece.	C	Ensure that the Work Lead is connected to the work piece and has a good connection to the work piece. Refer to Set Up for MIG Section 5.13 or 5.14.
		D	MIG Gun is not correctly connected to the Euro Style MIG Gun Adaptor.	D	Ensure that the MIG Gun is correctly connected to the Euro Style MIG Gun Adaptor. Refer to Section 4.01.2 & 5.02.
2	When welding at maximum output (WFS and Volts) the machine stops welding.	A	When output amperage exceeds the rated maximum output of the machine by 15%, the welding machine will sense this and initiates a safety circuit which stops the output current and displays an Over Current Warning Screen. Refer to Section 8.06 Warning Screens for further detail.	A	Reduce output amperage (WFS and Volts).
		B	Contact Tip of the MIG gun is too close to the work piece.	B	Increase distance between the Contact Tip of the MIG gun and the work piece.
		C	The Pre-set voltage is too high.	C	Decrease the Pre-set voltage.
		D	The MIG Welding Wire in use is not consistent with the selected MIG wire diameter, e.g. 0.8mm wire is selected but 0.9mm wire is used.	D	Ensure that the correct MIG Welding Wire Diameter is selected for MIG Wire being used. Refer to Section 5.10
3	Mains Supply Voltage is On, the On/Off switch in the rear panel is in the On position but the Front Control Panel is not illuminated and the power source will not weld.		This may occur due to the activation of an in-built protective device if the Power Source is repeatedly switched On then Off rapidly or the supply to the Power Source is switched On then Off rapidly.		If this occurs leave the Power Source On/Off switch in the Off position for several minutes to allow the protective device to reset.
4	The power source will not commence welding when the gun trigger switch is depressed and Over Temperature Warning Screen is showing on the Front Panel Display. This indicates an Over Temperature condition has occurred. Refer to Section 8.06 Warning Screens for further detail.		Duty cycle of power source has been exceeded.		Leave the power source switched ON and allow it to cool. Note that Over Temperature Warning Screen must be cleared from the Front Panel Display prior to commencement of welding.

	PROBLEM		CAUSE		REMEDY
5	Unit will not feed wire in MIG mode.	A	Incorrect Feed Roll fitted for wire type being used.	A	Fit the correct feed roll for MIG wire type being used. Refer to section 2.11 for optional feed rolls available and Section 5.09 for feed roll fitting details.
		B	Pressure Roller Arm is not secured. in the correct position or not correctly adjusted.	B	Secure Pressure Roller in the correct position and ensure that it is correctly adjusted. Refer to Section 5.07 and 5.08.
		C	Electrode wire stuck in conduit liner or contact tip (burn-back jam).	C	Check for clogged / kinked MIG Gun conduit liner or worn contact tip. Replace faulty components.
		D	Internal fault in power source.	D	Have an Accredited CIGWELD Service Provider investigate the fault.
6	Welding wire continues to feed when MIG Gun trigger is released.	A	MIG Gun Trigger in 4T Mode.	A	Change MIG Gun Trigger Mode to 2T.
		B	MIG Gun trigger leads shorted, or faulty MIG Gun Trigger.	B	Repair or replace MIG Gun trigger switch/lead.
7	Welding arc cannot be established in MIG mode.	A	MIG Gun polarity lead is not connected on the welding output terminal.	A	Connect the MIG Gun polarity to either the positive welding output terminal or the negative welding output terminal as required. Refer to Section 4.01.3.
		B	Poor or no work lead contact.	B	Clean work clamp area and ensure good electrical contact.
8	Inconsistent wire feed.	A	Worn or dirty contact tip.	A	Replace if necessary.
		B	Incorrect or worn feed roll.	B	Replace if necessary.
		C	Excessive brake tension on wire reel hub.	C	Reduce brake tension on spool hub.
		D	Worn, kinked or dirty conduit liner.	D	Clean or replace conduit liner.
9	No gas flow in MIG mode.	A	Gas hose is damaged.	A	Replace or repair.
		B	Gas passage contains impurities.	B	Disconnect gas hose from the rear of power source and blow out impurities.
		C	Machine set in MIG Gasless mode.	C	Set Machine to MIG Gas mode.
		D	Empty gas cylinder.	D	Replace gas cylinder.
		E	Cylinder Valve not turned on.	E	Turn Cylinder valve in anticlockwise direction until gas is flowing.
		F	Gas shielding hose connected to TIG gas inlet.	F	Connect Gas Shielding hose to MIG gas inlet.
10	Gas flow continues after the MIG Gun trigger switch has been released (MIG Gas Solid mode).		Gas valve has jammed open due to impurities in the gas or the gas line.		Have an accredited CIGWELD service provider repair or replace gas valve.

Table 5-5: Welding Problems

SECTION 6:
TIG (GTAW) WELDING

6.01 TIG WELDING BASICS

Gas Tungsten Arc Welding (GTAW) or TIG (Tungsten Inert Gas) as it is commonly referred to, is a welding process in which fusion is produced by an electric arc that is established between a single tungsten (non-consumable) electrode and the work piece. Shielding is obtained from a welding grade shielding gas or welding grade shielding gas mixture which is generally Argon based. A filler metal may also be added manually in some circumstances depending on the welding application.

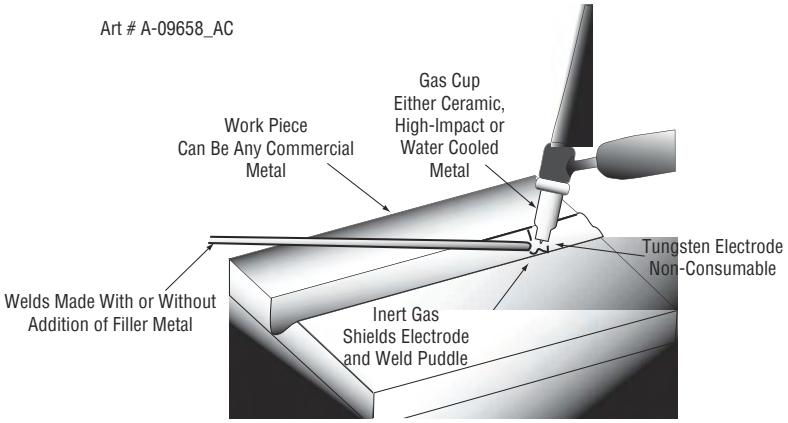


Figure 6-1: TIG Welding Application Shot

TUNGSTEN ELECTRODE CURRENT RANGES

Electrode Diameter	DC Current (Amps)
0.040” (1.0mm)	30-60
1/16” (1.6mm)	60-115
3/32” (2.4mm)	100-165
1/8” (3.2mm)	135-200
5/32” (4.0mm)	190-280
3/16” (4.8mm)	250-340

Table 6-1: Current Ranges for Various Tungsten Electrode Sizes

TUNGSTEN ELECTRODE CURRENT RANGES

Filler wire Diameter	DC Current (Amps)
1/16” (1.6mm)	60-115
3/32” (2.4mm)	100-165
1/8” (3.2mm)	135-200
3/16” (4.8mm)	250-340

Table 6-1: Filler Wire Selection Guide

NOTE

The operator should use the welding current range values as a guide only, then finally adjust the current setting to suit the application.

BLUEVENOM XF210⁶ TIG WELDING FILLER RODS SELECTION CHART

DESCRIPTION	CLASS. AUS/ NZ STD (NEW)	CLASS. AWS STD	DIA.	PACK	PART NO	APPLICATION
COMWELD SUPER STEEL	R2	ER70S-2	1.6mm 2.4mm	5kg Pack 5kg Pack	321370 321373	Comweld Super Steel is a copper coated 'triple deoxidised' steel welding rod recommended for the high quality Gas Tungsten Arc (TIG) welding of carbon and carbon-Manganese steels. Comweld Super Steel is deoxidised with Titanium, Aluminium and Zirconium in addition to Manganese and Silicon for improved weld deposit quality. It is the ideal choice for TIG welding rusty or mill scaled plates and pipes and the root pass welding of pipes, tanks and heavy walled root toughness and radiographic soundness are achieved under high dilution.
COMWELD LW1-6	R6	ER70S-6	1.6mm 2.4mm	5kg Pack 5kg Pack	321417 321418	Comweld LW1-6 is a copper coated, low carbon steel filler rod suitable for Gas Tungsten Arc (TIG) welding of a wide range of mild and medium strength steels. Comweld LW1-6 is recommended for the TIG welding of steel pipes, plates and castings with a tensile strength in the 500 MPa class. It is tolerant to surface rust and mill scale and is ideal for root pass welding applications where tough and ductile welds are produced. Please Note: A suitable shielding gas is required
COMWELD CRMO1	RB2	ER80S-B2	2.4mm	5kg Pack	321379	Comweld CrMo1 is a copper coated steel TIG welding rod alloyed with nominally 1.25% Chromium (Cr) and 0.50% Molybdenum (Mo). It is recommended for the TIG welding of 1/2Cr-1/2Mo, 1Cr1/2Mo and 1 1/4Cr-1/2Mo steel pipes, plates and castings used at elevated service temperatures (up to 550°C) in the power and petrochemical industries etc. Comweld CrMo1 is also suitable for the dissimilar TIG welding of Cr-Mo steel to carbon steel and for the welding of case hardenable steels or steels which can be subsequently heat treated.
COMWELD CRMO2	RB3	ER90S-B3	2.4mm	5kg Pack	321383	Comweld CrMo2 is a copper coated steel TIG welding rod alloyed with nominally 2.5% Chromium (Cr) and 1.0% Molybdenum (Mo).It is recommended for the TIG welding of 2 1/4Cr - 1 Mo and CrMo-V steel pipes, plates and castings used at elevated service temperatures (up to 600°C) in the power and petrochemical industries etc. Comweld CrMo2 is also suitable for the dissimilar TIG welding of selected Cr-Mo steels to carbon steel and for the TIG welding of heat treatable steels and case hardenable steels with up to 3% Chromium content.

BLUEVENOM XF210⁶ TIG WELDING FILLER RODS SELECTION CHART						
DESCRIPTION	**CLASS. AUS/ NZ STD (NEW)**	**CLASS. AWS STD**	**DIA.**	**PACK**	**PART NO**	**APPLICATION**
COMWELD 308L	R308L	ER308L	1.6mm	5kg Pack	321406	Comweld 308L stainless steel is a high quality low carbon rod for the Gas or Gas Tungsten Arc (TIG) welding of a wide range of low carbon and stabilised 300 series stainless steels. It is recommended for the critical welding of 304 and 304L stainless steels in corrosion resistant and cryogenic applications.
			2.4mm	5kg Pack	321407	
COMWELD 309L	R309L	ER309L	1.6mm	5kg Pack	321403	Comweld 309L stainless steel is a high quality low carbon rod for the Gas or Gas Tungsten Arc (TIG) welding of highly alloyed 309 or 309L type stainless steels. Comweld 309L is also suitable for the dissimilar joining of other 300 series austenitic stainless steels to ferritic steels.
			2.4mm	5kg Pack	321404	
COMWELD 316L	R316L	ER316L	1.6mm	5kg Pack	321400	Comweld 316L stainless steel is a high quality low carbon rodfor the Gas or Gas Tungsten Arc (TIG) welding of Molybdenum bearing stainless steels; in particular matching 316 and 316L alloys. Comweld 316L is also suitable for the general welding of other 300 series stainless steels including 302 and 304; as well as ferritic stainless steels grades such as 409, 444 and 3Cr12.
			1.6mm	25 Rod Handypack	322054	
			2.4mm	5kg Pack	321401	
COMWELD AL5356	R5356	ER5356	1.6mm	2.5kg Pack	321640	Comweld AL5356 is a high quality, Aluminium - nominal 5% Magnesium alloy rod suitable for the Gas or Gas Tungsten Arc (TIG) welding of a wide range of cast and wrought Aluminium alloys.It produces intermediate deposit strength and good ductility and corrosion resistance for the Gas or Gas Tungsten Arc Welding (GTAW / TIG) of a wide rangeof 3XXX, 5XXX, 6XXX and 5XX Aluminium alloys. See CIGWELD Aluminium Alloy Selection Chart for detailed welding consumable selection criteria for a wide range of Aluminium alloy parent metals.
			1.6mm	1Kg Pack	WTA016	
			2.4mm	2.5kg Pack	321641	
			2.4mm	1Kg Pack	WTA024	
			3.2mm	2.5kg Pack	321642	

Table 6-3: Welding Filler Rods Selection Chart

TIG Welding is generally regarded as a specialised process that requires operator competency. While many of the principles outlined in the previous Arc Welding section are applicable a comprehensive outline of the TIG Welding process is outside the scope of this Operating Manual. For further information please refer to **cigweld.com.au** or contact **Cigweld.**

6.02 TIG REGULATOR/ FLOWMETER

SHIELDING GAS CONNECTION

WARNING

This equipment is designed for use with welding grade (Inert) shielding gases only.

This regulator/flowmeter is designed to reduce and control high pressure gas from a cylinder or pipeline to the working pressure required for the equipment using it.

If the equipment is improperly used, hazardous conditions are created that may cause accidents. It is the users responsibility to prevent such conditions. Before handing or using the equipment, understand and comply at all times with the safe practices prescribed in this instruction.

SPECIFIC PROCEDURES for the use of regulators/ flowmeters are listed below.

1. **NEVER** subject the Regulator/Flowmeter to an inlet pressure greater than its rated inlet pressure.
2. **NEVER** pressurize a Regulator/Flowmeter that has loose or damaged parts or is in a questionable condition. NEVER loosen a connection or attempt to remove any part of a Regulator/Flowmeter until the gas pressure has been relieved. Under pressure, gas can dangerously propel a loose part.
3. **DO NOT** remove the Regulator/Flowmeter from a cylinder without first closing the cylinder valve and releasing gas in the Regulator/Flowmeter high and low pressure chambers.
4. **TURN OFF** When equipment is not in use for extended periods of time, shut off the gas at the cylinder valve and release the gas from the equipment.
5. **OPEN** the cylinder valve SLOWLY. Close after use.

CAUTION

Match regulator/flowmeter to cylinder. NEVER CONNECT a regulator/flowmeter designed for a particular gas or gases to a cylinder containing any other gas.

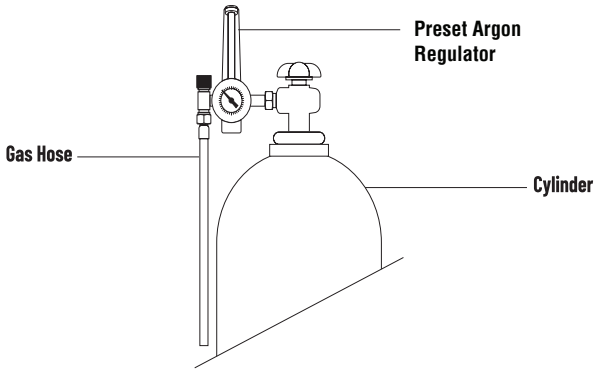


Figure 6-2: Fit Regulator/flowmeter to Cylinder

INSTALLATION

1. Remove cylinder valve plastic dust seal. Clean the cylinder valve outlet of impurities that may clog orifices and damage seats before connecting the Regulator/Flowmeter. Crack the valve (open then close) momentarily, pointing the outlet away from people and sources of ignition. Wipe with a clean lint free cloth.
2. Match Regulator/Flowmeter to cylinder. Before connecting, check that the Regulator/Flowmeter label and cylinder marking agree and that the Regulator/Flowmeter inlet and cylinder outlet match. NEVER CONNECT a Regulator/Flowmeter designed for a particular gas or gases to a cylinder containing any other gas.
3. Connect the Regulator/Flowmeter inlet connection to cylinder or pipeline and tighten it firmly but not excessively, with a suitable spanner.
4. Connect and tighten the outlet hose firmly and attach the hose to the welding machine with the Quick Connect fitting. Ensure no gas leakage. The flowmeter must be in the vertical position to read accurately.
5. The regulator/flowmeter has a self-reseating relief valve – not designed to protect downstream equipment. To protect sensitive downstream equipment a separate safety device may be necessary.

OPERATION

With the Regulator/Flowmeter connected to cylinder or pipeline:

1. Stand to one side of Regulator/Flowmeter and slowly open the cylinder valve. If opened quickly, a sudden pressure surge may damage internal Regulator/Flowmeter parts.
2. Since the regulator is a preset type, no adjustments to the regulator are necessary. Before opening the cylinder valve, be sure that the flow adjusting valve is in a finger-tight "OFF" position (clockwise).
3. Slowly and carefully, open the cylinder valve until the maximum pressure registers on the high pressure gauge.

CAUTION

DO NOT purge oxidising or flammable gases in the presence of flame, lit cigarettes, or other sources of ignition or in a confined space.

Close equipment valve(s) after purging, and test all connections for leaks with a suitable leak detection solution or soapy water. Never use a flame when testing for leaks.

ADJUSTING FLOW RATE

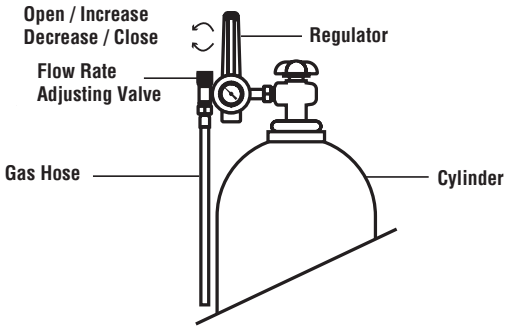


figure 6-3: adjust flow rate

With the Regulator/Flowmeter ready for operation, adjust working flow rate as follows:

1. Slowly turn adjusting valve in anti-clockwise direction to open and increase until the bobbin in the flow tube indicates the required flow rate.

NOTE

It may be necessary to re-check the shielding Gas Regulator/Flowmeter flow rate following the first weld sequence due to back pressure present within shielding gas hose assembly.

2. To reduce flow rate, allow the welding grade shielding gas to discharge from regulator by opening the downstream valve. Bleed welding grade shielding gas into a well ventilated area and away from any ignition source. Turn adjusting screw clockwise, until the required flow rate is indicated on the gauge. Close downstream valve.

SHUTDOWN

Close cylinder valve whenever the Regulator/Flowmeter is not in use. To shut down for extended periods (more than 30 minutes).

1. Close cylinder valve tightly.
2. Remove the gas from the machine and hose by pressing the Gas Purge button on the front of the machine, or by pressing the trigger on the MIG Gun. Bleed gas into a well ventilated area.
3. After gas is drained completely turn off the machine.
4. Before transporting cylinders that are not secured on a cart designed for such purposes, remove regulators/flowmeters.

6.03 TIG MODE NAVIGATION

From the Main Menu, navigate to the TIG section and press the Left Knob to access it.

You will then be prompted to choose between:

- **TIG AUTOSET**
- **TIG MANUAL**

Select the desired option and press the **Left Knob** to enter that mode.

TIG AUTOSET

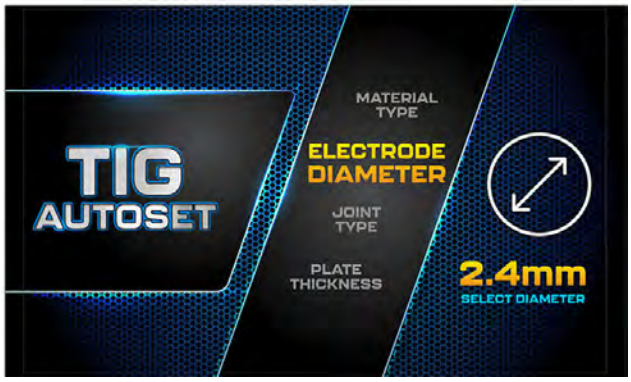
After entering the TIG AUTOSET section, you can adjust the following parameters:

MATERIAL TYPE

This Setting allows the user to select the material they are welding. Available options are: Aluminium, Steel and Stainless Steel.

ELECTRODE DIAMETER

This Setting allows the user to select the Tungsten Electrode Diameter they are using. The available options are 1.6mm, 2.4mm and 3.2mm.



JOINT TYPE

This Setting allows the user to select the Joint Type they are welding. Different Joint Types require different parameters, so selecting the correct Joint type helps achieve optimal results.

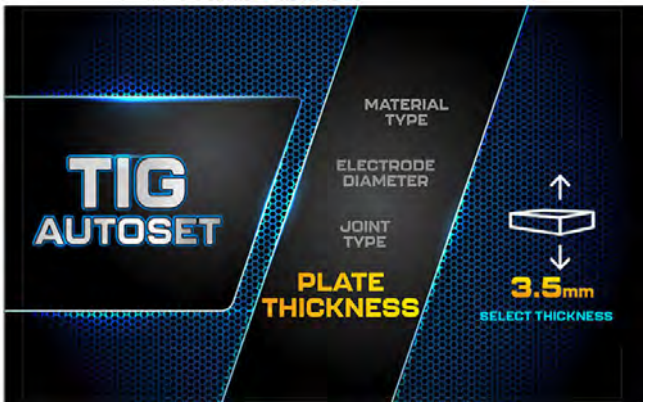
Joint Types available are: Fillet Weld, Butt Weld, Lap Joint and Corner Weld.

PLATE THICKNESS

The Plate thickness setting allows the user to choose the thickness of the material they are welding to achieve the optimal amperage setting.

They can be adjusted in this screen, and/or in the welding screen.

NOTE: Plate thickness ranges are dependent on Material Type, Tungsten sizes, Joint Type and in Aluminium waveform. For example, if 1.6mm tungsten is chosen for aluminium, the plate thickness range is 1.0mm to 4.0mm. This is due to the limitations of the tungsten.



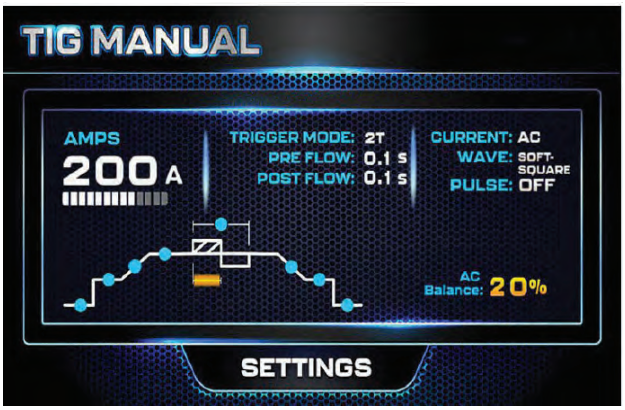
If you wish to modify parameters after selecting an AUTOSET option:

1. Short-press the **Forward Arrow** until the screen changes, displaying a detailed view of the parameters.
2. Adjust each value as needed according to your preference.

To save a quick job number:

- Long-press the Forward Arrow again to access the Memory screen and save the job.

TIG MANUAL



After entering the TIG MANUAL section, you can adjust the following parameters:

You may make selections to the below parameters:

A – AMPS

B – Trigger Mode

C – Pre Flow

D – Post Flow

E – Current with modes available AC, DC, DC Cold Weld and AC+DC

F – Wave (available only in AC and AC+DC modes; options include: Square, Sine, Triangle, Square-Sine, Square-Triangle, Sine-Square, Sine-Triangle, Triangle-Square, Triangle-Sine, Trapezoidal, Soft Square).

G – Pulse (On/Off)

NOTES:

- Each parameter may have specific limitations and rules.
- The available range for some settings may change depending on the Material Type.

ADJUSTING PARAMETERS:

1. To quickly adjust AMPS, rotate the Left Control Knob.
2. To access the synergic line and make changes:
3. Once adjustments are complete, click either the Right or Left Control Knob to exit the synergic line settings.

- Click either the Right or Left Control Knob.
- Rotate the Left Control Knob to move between selections.
- Use the Right Control Knob to change the value of the highlighted parameter.

Adjustable sections within the synergic line include:

- **Trigger Mode (2T, 4T, 8T)**
- **Pre Flow**
- **Start Current**
- **Up Slope**
- **Peak Current**
- **AC Frequency**
- **AC Balance**

- **Down Slope**
- **End Current**
- **Post Flow**
- **Mix Frequency (AC+DC Setting)**
- **DC% (AC+DC Setting)**
- **Pulse Width**
- **Frequency (Need to have AC selected)**

TRIGGER MODE CONTROL

The **Trigger Mode** allows you to switch the torch trigger functionality between **2T (Normal), 4T (Latch Mode), and Spot Mode.**

2T – Normal Mode

In this mode, the torch trigger must remain pressed for the welding output to be active.

- Press and hold the trigger to start welding.
- Release the trigger to stop welding.

4T – Latch Mode

This mode is ideal for long welds to reduce operator fatigue.

- Press and release the torch trigger once to start welding.
- The output remains active without holding the trigger.
- Press and release the trigger again to stop welding. allowing continuous welding without holding the trigger.

NOTE: When operating in **GTAW (HF TIG)** mode, the power source will remain active until the selected Down Slope time has elapsed.

8T - Mode

The **8T mode** provides advanced control over the welding process, allowing the operator to activate and adjust welding current in multiple stages without continuously holding the trigger.

Operation Overview

In **8T mode**, the torch trigger functions as follows:

1. **First Press** – The arc starts, and the welding current rises to the preset level.
2. **First Release** – The current holds at the peak level, allowing continuous welding without holding the trigger.
3. **Second Press** – The current transitions to a lower (background) current, enabling heat control or crater filling.
4. **Second Release** – The arc is terminated, completing the welding cycle.

Advantages

- Reduces operator fatigue by eliminating the need to hold the trigger during long welds.
- Allows smooth transitions between welding and crater-fill stages.

NOTES

- Ensure 8T mode is selected on the machine before operation.
- Adjust the background current and ramp times (if applicable) to match your welding procedure.
- Familiarize yourself with the trigger sequence before production use.

6.04 TIG MODE PARAMETERS

CAUTION

HF is present in all TIG modes. This may cause damage to measuring equipment connected to the output of this power source.

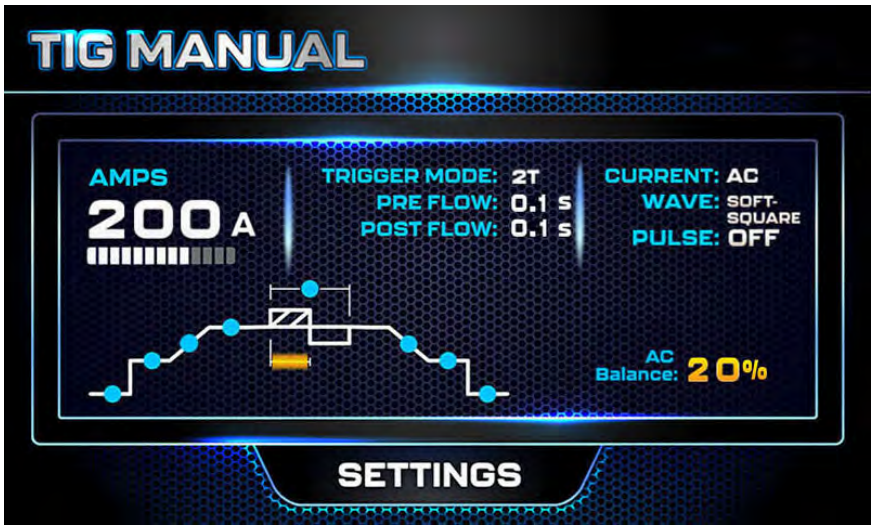


Figure 6-4: TIG Programming Mode

Pre-Flow

This parameter operates in TIG modes only and is used to provide gas to the weld zone prior to striking the arc, once the torch trigger switch has been pressed. This control is used to dramatically reduce weld porosity at the start of a weld.
This parameter has a range of 0.1s to 3.0s.

Start Current

This parameter operates in TIG modes only and is the starting current that the arc will initially commence at prior to ramping up to Peak current.
This parameter has a range of 10A to 210A.

Up Slope

This parameter operates in TIG modes only and is used to set the time for the weld current to ramp up, after the torch trigger switch has been depressed then released, from Start Current to Peak Current. This parameter has a range of 0.0s to 20.0s.

Peak Current

This parameter sets the Peak weld current when in TIG mode. In Autoset mode the maximum Peak current is determined by Material Type, Tungsten Size, Joint Type and Waveform in Aluminium. For example, if 1.6mm tungsten is chosen for aluminium, the plate thickness range is 1.0mm to 4.0mm. This is due to the limitations of the tungsten. In manual mode, Peak Current is determined by Waveform in Aluminium.

Pulse Width (Pulse Mode only)

This parameter sets the percentage of time the weld current will remain in Peak Current when in AC or DC Pulse TIG mode. The higher the percentage, the more time spent in Peak Current, and less time in Base Current.
This parameter has a range of 10% to 90%.

Base Current (Pulse Mode only)

This parameter sets the base current in AC or DC TIG Pulse mode as a percentage of Peak Current. It is set as a percentage and if the Peak Current is changed, the base current will also change.
This parameter has a range of 5% to 75%.

Frequency (Pulse Mode only)	AC Balance	AC Frequency
The amount of pulse cycles in a time period. The higher the frequency, the more pulse cycles per time period. When the pulse frequency is set low, the weld pool will have time to partially solidify between each pulse. If the frequency is set high, a more focused arc can be obtained. This parameter has a range of 0.5Hz to 500HZ.	This parameter operates in AC TIG modes and is used to set the penetration to cleaning action ratio for the AC weld current. Used to adjust the balance (%) in AC TIG mode, it is the ratio between Electrode Positive (EP) and Electrode Negative (EN) in a waveform. Balance lets you control the arc width, heat, and cleaning action etc. Benefits of increasing the balance (i.e., increasing the EN portion of the AC TIG waveform): • Achieve greater penetration. • Helps in increasing travel speeds. • Helps in narrowing the weld bead. • Helps in increasing the tungsten electrode life and reduces balling action. • Reduces the size of etched zone for improved cosmetics. Benefits of decreasing the balance (i.e., increasing the EP portion of the AC TIG waveform): • Better cleaning action to remove heavier oxidation on the work plate. • Minimizes penetration which help prevent burn-through on thin materials. • Widens the bead profile and helps in catching both sides of the joint. • This parameter has a range of 10% to 65%	This parameter operates in AC TIG mode or AC Pulse TIG mode and is used to set the frequency for the AC weld current. This parameter has a range of 10Hz to 250Hz.
Down Slope	**End Current**	**Post Flow**
This parameter operates in TIG modes only and is used to set the time for the weld current to ramp down, after the torch trigger switch has been released, from Peak Current to End Current. This parameter has a range of 0.0s to 25.0s	This parameter operates in TIG modes only and is used to set the finish current for TIG. The End Current remains ON until the torch trigger switch is released and is used to cool the weld slowly to avoid craters, cracks and pin holes at the end of a weld. This parameter has a range of 10A to 210A.	This parameter operates in TIG modes only and is used to adjust the post gas flow time once the arc has extinguished. This parameter is used to dramatically reduce oxidation of the tungsten electrode, reduce the likelihood of the weld being contaminated, and to help cool the TIG Torch. This parameter has a range of 0.0s to 30.0s

Table 6-3: Programming Parameter

AC Balance is used for aluminium welding in AC TIG mode
It is used to set the ratio of penetration to cleaning action for the AC TIG welding arc.
Maximum weld penetration is achieved when the AC Balance is set to 10%. Maximum cleaning of heavily oxidized aluminium or magnesium alloys is achieved when the AC Balance is set to 65%.

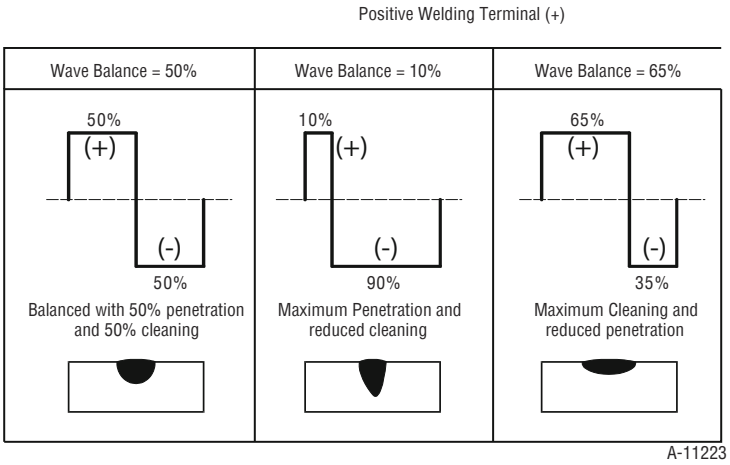


Figure 6-5: AC TIG Wave Balance

6.05 MANUAL TIG COLD WELD

Only available when in MANUAL TIG mode, simply navigate to CURRENT to select DC COLD WELD.

COLD WELD parameters

- Pre Flow 0.1 to 3.0 s
- Weld Time 1 to 200 ms
- Peak Current 10 to 210 A
- Frequency 0 to 10 Hz
- Post Flow 0.0 to 30.0 s

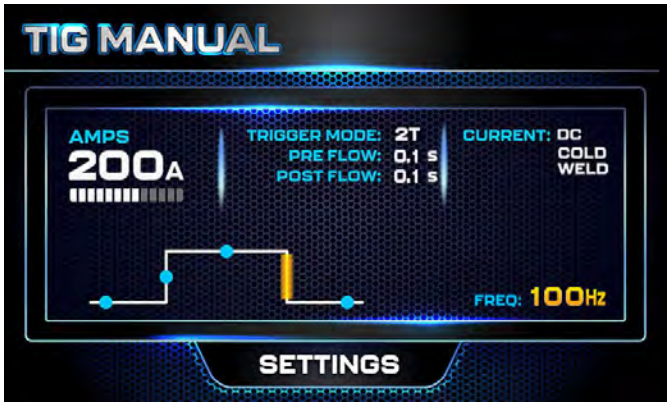


Figure 6-7: TIG COLD WELD

6.06 TIG WELDING

A. Select a TIG mode with the process selection control (refer to Section 6.03 for further information).

B. Connect the TIG Torch to the negative welding terminal (-). Refer to Note below for Optional TIG Torch information. Welding current flows from the power source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

C. Connect the TIG torch trigger switch and remote current control if applicable via the 8 pin socket located on the front of the Power Source. The TIG torch will require a trigger switch to weld in TIG Mode.

D. Connect the work lead to the positive welding terminal (+). Welding current flows from the Power Source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

E. Connect the Argon Regulator/Flowmeter to the Welding Grade Argon Shielding Gas Cylinder then connect the TIG Torch gas hose to regulator. Before turning on shielding gas check that all fittings are tight and the gas valve on the TIG torch is turned off. Before commencing to TIG weld open TIG torch gas valve to allow sufficient shielding gas flow when welding. Refer to Section 5.02 for recommended Shielding Gas flow rates and other TIG Welding information.

WARNING

Secure the welding grade shielding gas cylinder in an upright position by chaining it to a suitable stationary support to prevent falling or tipping.

Open Gas Cylinder Valve carefully.

WARNING

Before connecting the work clamp to the work piece and inserting the electrode in the TIG torch make sure the Mains power supply is switched OFF.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

NOTE

If the TIG torch has a trigger switch or a remote TIG torch current control fitted then it will require to be connected to the 8 pin socket. (Refer to section 4.02.3 Remote Control Socket for further information).

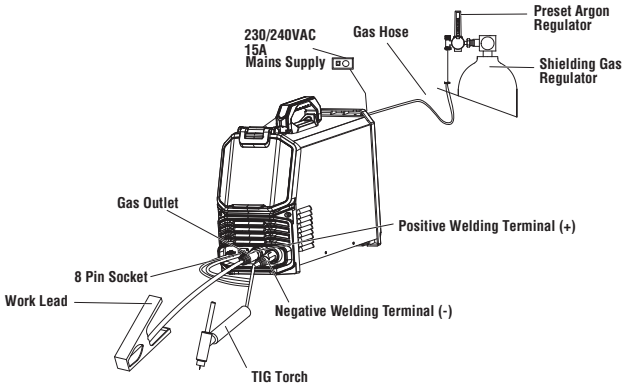


Figure 6-6: Setup For TIG (GTAW) Welding

6.07 TIG WELDING ISSUES - CAUSE & REMEDY

Select a TIG mode with the process selection control (refer to Section 6.03 for further information).

FAULT	CAUSE	REMEDY
Excessive bead build up or poor penetration or poor fusion at edges of weld.	Welding current is too low.	Increase weld current and/or faulty joint preparation.
Weld bead too wide and flat or undercut at edges of weld or excessive burn through.	Welding current is too high.	Decrease weld current.
Weld bead too small or insufficient penetration or ripples in bead are widely spaced apart.	Travel speed too fast.	Increase travel speed.
Weld bead too wide or excessive bead build up or excessive penetration in butt joint.	Travel speed too slow.	Increase travel speed.
Uneven leg length in fillet joint.	Wrong placement of filler rod.	Re-position filler rod.
Electrode melts or oxidises when an arc is struck.	A. Torch lead connected to positive welding terminal.	A. Connect torch lead to negative welding terminal.
	B. No shielding gas flowing to welding region.	B. Check the shielding gas lines for kinks or breaks and shielding gas cylinder contents.
	C. Torch is clogged with dust or dirt.	C. Clean torch.
	D. Shielding gas hose is damaged.	D. Replace shielding gas hose.
	E. Shielding gas regulator turned off.	E. Turn On Shielding Gas and adjust Shielding Gas flow rate for the welding job.
	F. The electrode is too small for the welding current.	F. Increase electrode diameter or reduce the welding current.
Dirty weld pool	A. Electrode contaminated by contact with work piece or filler rod material.	A. Clean the electrode by grinding off the contaminates.
	B. Work piece surface has foreign material on it.	B. Clean surface.
	C. Shielding gas contaminated with air.	C. Check shielding gas lines for cuts and loose fitting or change shielding gas cylinder.
Poor weld finish	Inadequate shielding gas.	A. Increase shielding gas flow or check shielding gas line for shielding gas flow problems.

FAULT	CAUSE	REMEDY
Arc start is not smooth	A. Tungsten electrode is too large for the welding current. B. The wrong electrode is being used for the welding job. C. Shielding gas flow rate is too high. D. Incorrect shielding gas is being used. E. Poor work clamp connection to work piece.	A. Select the right size tungsten electrode. Refer to Table 6-2 Cigweld Tungsten Electrode Selection Chart. B. Select the right size tungsten electrode type. Refer to Table 6-2 Cigweld Tungsten Electrode Selection Chart. C. Select the right shielding gas flow rate for the welding job. D. Select the correct shielding gas. E. Improve connection to work piece.
Arc flutters during TIG welding.	A. Tungsten electrode is too large for the welding current.	A. Select the right size tungsten electrode. Refer to Table 6-2 Cigweld Tungsten Electrode Selection Chart.

Table 6-5: TIG (GTAW) Welding Problems

SECTION 7:
STICK (MMAW) WELDING

7.01 STICK WELDING BASICS

Metal arc welding electrodes consist of a core wire surrounded by a flux coating. This flux coating, applied to the core wire by an extrusion process, serves the following key functions:

A. To provide a gaseous shield for the weld metal, preserving it from contamination by the atmosphere whilst in a molten state.

B. To steady the arc by providing an arc stabilising bridge for the flow of the welding current.

C. To provide deoxidisers for the removal of oxygen from the weld metal and weld pool.

D. To provide a cleansing action on the work piece and a protective slag cover over the weld metal to prevent the formation of oxides while the metal is solidifying. The slag also helps to produce a bead of the desired contour.

E. To introduce alloys into the weld deposits in special type electrodes.

STICK ELECTRODE TYPES

Arc Welding electrodes are classified into a number of groups depending on their applications. There are a great number of electrodes used for specialised industrial purposes which are not of particular interest for everyday general work. These include some low hydrogen types for high tensile steel, cellulose types for welding large diameter pipes, etc. The range of electrodes dealt with in this publication will cover the vast majority of applications likely to be encountered; are all easy to use and all will work on even the most basic of welding machines.

CIGWELD ELECTRODE SELECTION CHART

DESCRIPTION	CLASS. AUS/NZ STD (NEW)	CLASS. AWS STD	DIA.	PACK	PART NO	APPLICATION
SATINCRAFT 13	B E4313 A	E6013	2.5mm 2.5mm 3.2mm 3.2mm 4mm	1kg Pack 2.5kg Pack 1kg Pack 2.5kg Pack 5kg Pack	322135 612182 322136 612183 611184	A high performance General Purpose (GP) welding electrode suitable for all positional welding, except vertical-down, for use on, mild and galvanised steel pipes, plates, angle iron, RHS, tubes and grid mesh.
WELDSKILL GP GENERAL PURPOSE WELDING	B E4313 A	E6013	2.0mm 2.0mm 2.0mm 2.5mm 2.5mm 2.5mm 2.5mm 3.2mm 3.2mm 3.2mm 3.2mm	25 Rod Handypack 1.0kg Pack 2.5kg Pack 20 Rod Handypack 1.0kg Pack 2.5kg Pack 5.0kg Pack 15 Rod Handypack 1.0kg Pack 2.5kg Pack 5.0kg Pack	WEG0220 WEG1020 WEG2520 WEG0225 WEG1025 WEG2525 WEG5025 WEG0232 WEG1032 WEG2532 WEG5032	A user-friendly General Purpose (GP) electrode offering a quiet, smooth arc action with a 6013 classification (min. strength rating of 60,000PSi). Ideal for welding thin section mild, galvanised and rusty steels and weld joints with poor fit-up. Great for use on vertical down fillet welding applications. Weldskill GP produces smooth professional mitre fillet welds in all positions with very low spatter levels, it features positive re-strike (hot or cold) and a self-releasing slag.
WELDSKILL HS HIGHER STRENGTH	B E4916 U A H10	E7016 H8	2.5mm 2.5mm 3.2mm 3.2mm	10 Rod Handypack 1.0kg Pack 10 Rod Handypack 1.0kg Pack	WEL0225 WEL1025 WEL0232 WEL1032	Higher Strength (HS) Hydrogen Controlled welding electrodes with a 7016 classification (min. strength rating of 70,000 PSi), well suited to welding steels under stress or with higher load bearing. The full covering slag is easy to control and remove.
WELDSKILL WELDIT ALL DISSIMILAR STEEL WELDING	B ES312-17	E312-17	2.5mm 2.5mm 3.2mm 3.2mm	10 Rod Handypack 1.0kg Pack 10 Rod Handypack 1.0kg Pack	WEW0225 WEW1025 WEW0232 WEW1032	WELDiT ALL is a highly alloyed stainless steel electrode that is extremely resistant to cracking (min. strength of 110,000PSi) it provides smooth, stable running in all positions (except vertical down) especially on low current settings. WELDit ALL is recommended for the repair and maintenance of all steels, particularly those of unknown composition. It is suitable for; Joining dissimilar steels, such as stainless steel to carbon steel, Repairing die or tool steels, as a protective overlay against corrosion and as an intermediate or buffer layer prior to hard surfacing. Not Recommended for Welding Cast Irons

CIGWELD ELECTRODE SELECTION CHART

DESCRIPTION	CLASS. AUS/ NZ STD (NEW)	CLASS. AWS STD	DIA.	PACK	PART NO	APPLICATION
WELDSKILL 316L STAINLESS STEEL WELDING	E316L-16	E316L-16	2.0mm	10 Rods	WES316020	WELDSKILL 316L stainless steel electrode has been formulated for the all positional (except vertical-down) fillet and butt welding of stainless steels. 316L produces low spatter levels with a smooth-running bead. Weldskill 316L is suitable for a wide range of Molybdenum bearing stainless steels, suitable for the general-purpose welding of other Austenitic stainless steels including 301, 302, 303 and 304/304L, 305, 3CR12 types. WeldSkill 316L is also suitable for the general welding of 400 series stainless steels including 410 and 430.
			2.0mm	1.0kg	WES316120	
			2.5mm	10 Rods	WES316025	
			2.5mm	1.0kg	WES316125	
			3.2mm	10 Rods	WES316032	
			3.2mm	1.0kg	WES316132	
WELDSKILL HARDA HARDFACING	1855-A4	--	3.2mm	10 Rod Handypack	WEH0232	HARDA is designed for hard surfacing of steel components subjected to wet or dry hard particle abrasion and low to moderate impact loading. The air hardening (~55RHc), low alloy steel deposit of WELDSKILL HARDA remains crack free on most steels and is therefore recommended for hard surfacing components subject to flexing during service. Typical applications include the surfacing of agricultural points, shears and tynes, grader and dozer blades, conveyor screws and post hole augers etc
			3.2mm	1.0kg Pack	WEH1032	
WELDSKILL CAST2STEEL CAST IRONS & CAST TO STEEL	--	ENiFe-CI	2.5mm	10 Rod Handypack	WEC0225	CAST2STEEL is a Nickel-Iron electrode designed for higher strength repair and maintenance welding of SG, Austenitic, Meehanites and Grey cast irons. It produces a soft stable arc with minimal penetration and spatter. The ductile Nickel-Iron weld deposit is machinable with the higher strength required for welding S.G. irons. Cast2Steel is also used to weld Cast Iron to Mild and Low Alloy Steels.
			2.5mm	1.0kg Pack	WEC1025	
			3.2mm	10 Rod Handypack	WEC0232	
			3.2mm	1.0kg Pack	WEC1032	

7.02 STICK MODE NAVIGATION

From the Main Menu, navigate to the STICK section and click the Left Control Knob to access it.

You will then be prompted to choose between:

- **STICK AUTOSET**
- **STICK MANUAL**

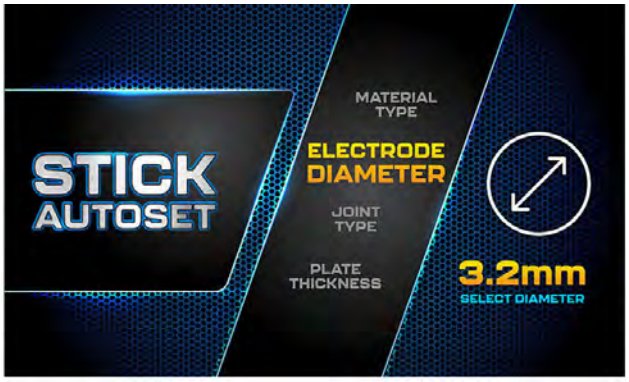
Select the desired option and click the **Left Control Knob** to enter that mode.

STICK AUTOSET

MATERIAL TYPE

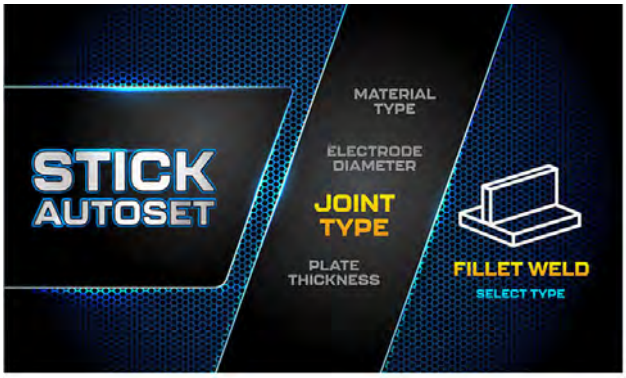
This Setting allows the user to select the material/ electrode type they are welding/using.

Available options are: Mild Steel Cellulosic, Low Hydrogen, Stainless Steel, Hardfacing and E312.



ELECTRODE DIAMETER

User able to set 2.0mm, 2.5mm, 3.2mm or 4.0mm.



JOINT TYPE

Joint Types available are Fillet Weld, Butt Weld, Lap Joint and Corner Weld. Setting the correct joint typ helps achieve optimal results.

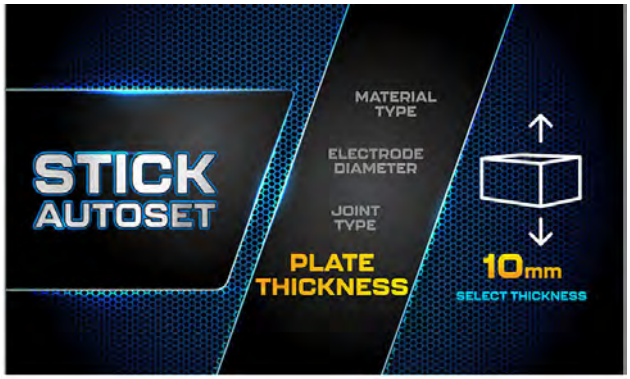
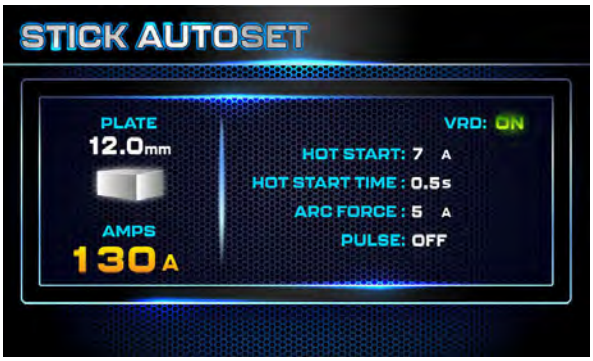


PLATE THICKNESS

This setting allows the user to choose the thickness of the material being welded and achieve optimal amperage setting.This can be adjusted in this screen, and/or in the welding screen.

NOTE: Plate thickness range is dependent on Material Type, Electrode sizes/type and Joint Type. For example, if a 2.5mm electrode is chosen for Low Hydrogen, the plate thickness range is 2.5mm to 4.0mm. A cellulose electrode ranges from 2.5mm to 5.0mm.



To modify parameters after selecting an AUTOSET option:

1. Press the Left Hand Control Knob and rotate until the setting you want to adjust highlights Yellow.
2. Using the Right Hand Control Knob rotate to adjust each value according to your preference.

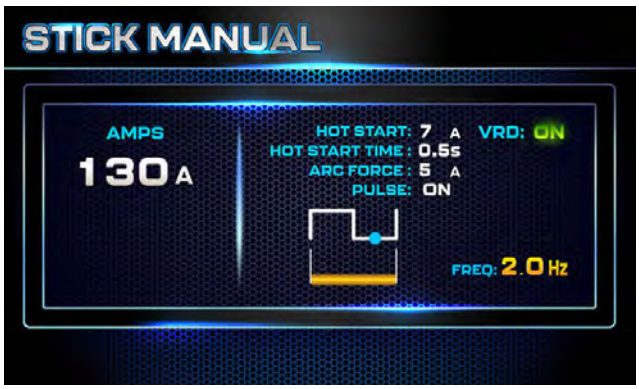
To store modified sub-parameters as a job:

- Long-press the **Forward button** again to access the **Memory** screen and save the job.

Returning to Previous Screen or Main Menu:

- Long-press the Back button to go back or return to the Main Menu.

STICK MANUAL



In STICK MANUAL mode, parameters able to adjust are:

- AMPS
- Hot Start
- Hot Start Time
- Arc Force
- Pulse

NOTES on VRD:

- **VRD** is a safety function and not able to be disabled.
- After welding starts, VRD automatically switches off to allow full output.

Adjusting Parameters:

1. To quickly adjust AMPS, rotate the Left Control Knob.
2. To access and adjust other parameters:

- Click either the Right or Left Control Knob.
- Click either the Right or Left Control Knob.
- Rotate the Left Control Knob to move between selections.
- Use the Right Control Knob to change parameter value.

Saving Settings as a Job number

- Long-press the Right Arrow button for 3 seconds and follow the steps in Section 5.03 – Memory and Job Numbers.

Returning to Main Menu:

- Long-press the Back Button for 3 seconds.

7.03 STICK MODE PARAMETERS

While welding, the RIGHT and LEFT CONTROL KNOBS adjust the BASE CURRENT.

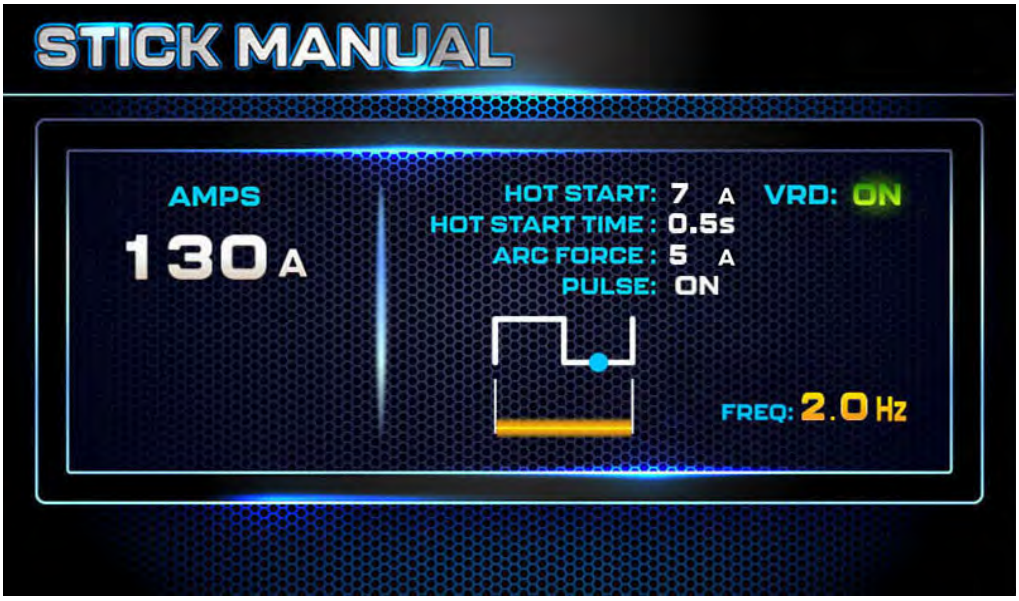


Figure 7-1: Stick Programming Mode

Hot Start

This feature operates in Stick (MMAW) mode. The Hot Start feature improves the arc start characteristics by momentarily increasing the welding current to a levelabove the preset amperage (Welding Current).

This parameter has an adjustment range of 5A to 100A.

e.g. If Amps is set to 100Amps, Hot start is set to 30Amps, the initial amps will be 130Amps.

Hot Start Time

Hot Start Time is the time in seconds that the Hot Start setting will run for.

This parameter has a range of 0.0s to 1.0s

Pulse ON/OFF

Utilizing the pulse function welders can achieve improved weld quality, better control over the process, and enhanced productivity, especially when working with challenging materials or in dxxxemanding welding applications.

Press the Left Control Knob to cycle through the settings until reaching Pulse (It will highlight). Use the Right Control Knob to turn Pulse Function ON or OFF. By

NOTE: If no adjustment is made after 5 seconds it will return to the primary adjustment screen.

Pulse Frequency (Pulse Freq or Pulse Speed)

It is the amount of times per second that a pulse (also known as cycle) will take place. The unit of measurement is Hertz (Hz). A Pulse cycles between a Pulse Base current (bottom of the pulse) and the Peak Current (top of the pulse). This allows you to control the overall heat input, maintain arc stability and have a better looking weld by improving control over the weld pool. Higher frequencies result in more rapid cycling between the two current levels. As an example, if the Pulse Frequency is set for 2 Hz, you will observe 2 pulses per second (10 pulses every 5 seconds).

Press the Left Control Knob to cycle through the settings until reaching Pulse Freq (Pulse Speed) (It will highlight). Use the Right Control Knob to adjust to the desired level. Pulse Frequency Range is 0.3 - 5Hz.

NOTE: If no adjustment is made after 5 seconds it will return to the primary adjustment screen.

Pulse Base Current (A)

It's the percentage of current that your Pulse will have at the Bottom (base). This percentage is calculated from your peak current, which you set as a combination of the Wire Feed Speed and Voltage. It is the low-current pulse that follows the peak current. It helps maintain the arc stability and keeps the weld pool in a controlled state while minimizing heat input. The background current is usually set at a lower value compared to the peak current. For example, if a Pulse Base Current of 60% is set, the variation will be 40% between Peak and Base. This will make the weld much hotter when the pulse is at the Top compared to the Bottom

Press the Left Control Knob to cycle through the settings until reaching Pulse Base Current (It will highlight). Use the Right Control Knob to adjust to the desired level. Pulse Base Current Range is 60 - 80%.

NOTE: If no adjustment is made after 5 seconds it will return to the primary adjustment screen.

Base Current

This parameter sets the current in DC or AC TIG mode, and the lowest current in DC or AC Pulse TIG mode. This parameter also sets the welding current in STICK mode.

Arc Force

Arc Force is effective when in Stick Mode only. Arc Force control provides and adjustable amount of Arc Force (or "dig") control. This feature can be particularly beneficial in providing the operator the ability to compensate for variability in joint fit-up in certain situations with particular electrodes. This parameter has a range of 0A to 100A.

Refer to Section 8.01 on Page 60 for Factory Reset Procedure.

Table 7-1: Programming Parameters

7.04 STICK WELDING

A. Select Stick mode with the process selection control.

B. Connect the Electrode Holder lead to the positive welding terminal (+). If in doubt, consult the electrode manufacturer. Welding current flows from the Power Source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

C. Connect the work lead to the negative welding terminal (-). If in doubt, consult the electrode manufacturer. Welding current flows from the power source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

WARNING

Before connecting the work clamp to the work and inserting the electrode in the electrode holder make sure the Mains power supply is switched off.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

NOTE

Consult the electrode manufacturer's information for the correct polarity.

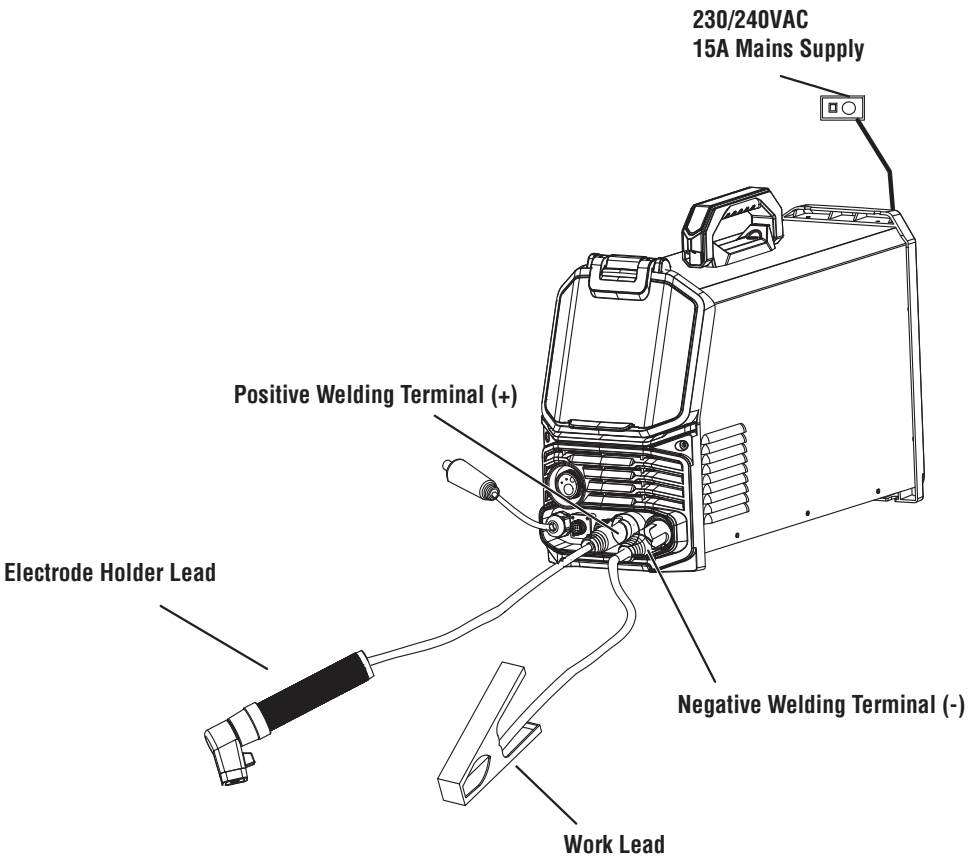


Figure 7-2: Setup For STICK (MMAW) Welding

Storage of Stick Electrodes

Always store electrodes in a dry place and in their original containers.

Stick Electrode Size

The electrode size is determined by the thickness of metals being joined and can also be governed by the type of welding machine available. Small welding machines will only provide sufficient current (amperage) to run the smaller size electrodes.

For most work, a 2.5mm electrode will be quite sufficient. A 2.5mm electrode will give just as strong a joint but may require a few more weld runs to be put down to fill the joint.

For thin sections, it is necessary to use smaller electrodes otherwise the arc may burn holes through the job. A little practice will soon establish the most suitable electrode for a given application.

Electrode Polarity

Electrodes are connected to the Electrode Holder, and the Work Lead is connected to the work piece.

Consult the Electrode manufacturer's information for the correct polarity.

STICK Welding Practice

Techniques used for arc welding are almost identical regardless of what types of metals are being joined. Naturally enough,

different types of electrodes would be used for different metals as described in the next section.

STICK Welding Different Metals

A. High tensile and alloy steels

The two most prominent effects of welding these steels are the formation of a hardened zone in the weld area, and, if suitable precautions are not taken, the occurrence in this zone of under-bead cracks may result. Hardened zone and under-bead cracks in the weld area may be reduced by using the correct electrodes, preheating, using higher current settings, using larger electrodes sizes, short runs for larger electrode deposits or tempering in a furnace.

B. Austenitic manganese steels

The effect on manganese steel of slow cooling from high temperatures is to embrittle it. For this reason it is absolutely essential to keep manganese steel cool during welding by quenching after each weld or skip welding to distribute the heat.

C. Cast Iron

Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron.

D. Copper and alloys

The most important factor is the high rate of heat conductivity of copper, making preheating of heavy sections necessary to give proper fusion of weld and base metal.

Welding Position

The electrodes dealt with in this publication can be used in most positions, i.e. they are suitable for welding in flat, horizontal, vertical and overhead positions. Numerous applications call for welds to be made in positions intermediate between these. Some of the common types of welds are shown in Figures 7-3 through 7-10.

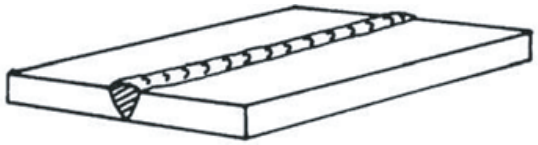


Figure 7-3: Flat position, down hand butt weld

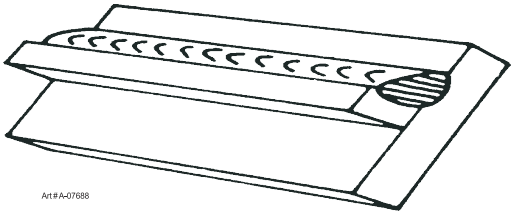


Figure 7-4: Flat position, gravity fillet weld

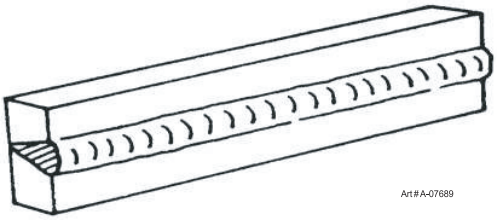


Figure 7-5: Horizontal position, butt weld

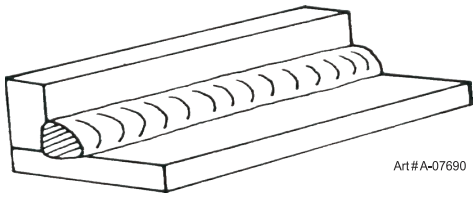


Figure 7-6: Flat position, down hand fillet weld

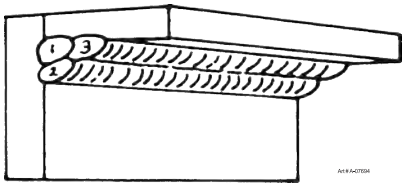


Figure 7-7: Overhead position fillet, weld

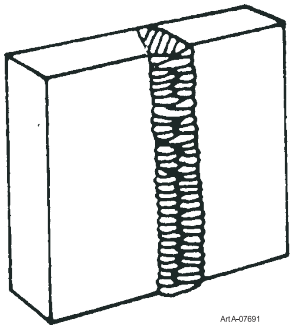


Figure 7-8: Vertical position, butt weld

Figure 7-9: Overhead position, butt weld

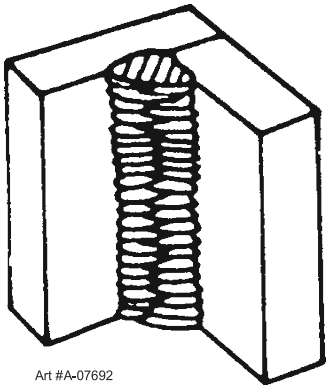


Figure 7-10: Vertical position, fillet weld

7.05 STICK WELDING ISSUES - CAUSE & REMEDY

	DESCRIPTION	POSSIBLE CAUSE	REMEDY
1.	Gas pockets or voids in weld metal (Porosity).	A. Electrodes are damp.	A. Dry electrodes before use.
		B. Welding current is too high.	B. Reduce welding current.
		C. Surface impurities such as oil, grease, paint, etc.	C. Clean joint before welding.
2.	Crack occurring in weld metal soon after solidification commences.	A. Rigidity of joint.	A. Redesign to relieve weld joint of severe stresses or use crack resistance electrodes.
		B. Insufficient throat thickness.	B. Travel slightly slower to alloy greater build-up in throat.
		C. Cooling rate is too high.	C. Preheat plate and cool slowly.
3.	A gap is left by failure of the weld metal to fill the root of the weld.	A. Welding current is too low.	A. Increase welding current.
		B. Electrode too large for joint.	B. Use smaller diameter electrode.
		C. Insufficient gap.	C. Allow wider gap.
		D. Incorrect sequence.	D. Use correct build-up sequence.

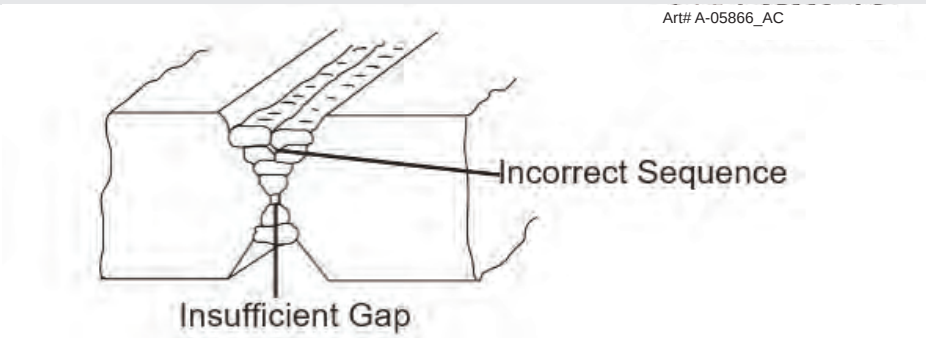


Figure 7-11: Example of Insufficient Gap or Incorrect Sequence

4.	Portions of the weld run do not fuse to the surface of the metal or edge of the joint.	A. Small electrodes used on heavy cold plate.	A. Use larger electrodes and preheat the plate.
		B. Welding current is too low.	B. Increase welding current.
		C. Wrong electrode angle.	C. Adjust angle so the welding arc is directed more into the base metal.
		D. Travel speed of electrode is too high.	D. Reduce travel speed of electrode.
		E. Scale or dirt on joint surface.	E. Clean surface before welding.

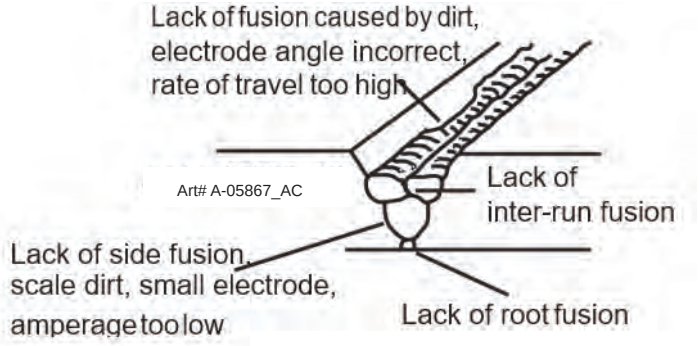


Figure 7-12: Example of Lack of Fusion

	DESCRIPTION	POSSIBLE CAUSE	REMEDY
5.	A groove has been formed in the base metal adjacent to the toe of a weld and has not been filled by the weld metal (undercut).	A. Welding current is too high.	A. Reduce welding current.
		B. Welding current is too low.	B. Reduce the length of the welding arc.
		C. Angle of the electrode is incorrect.	C. Electrode should not be inclined less than 45° to the vertical face.
		D. Joint preparation does not allow correct electrode angle.	D. Allow more room in joint for manipulation of the electrode.
		E. Electrode too large for joint.	E. Use smaller gauge electrode.
		F. Insufficient deposit time at edge of weave.	F. Pause for a moment atedge of weave to allow weld metal build-up.

Figure 7-13: Examples of undercut

6.	Non-metallic particles are trapped in the weld metal (slag inclusion.)	A. Non-metallic particles may be trapped in undercut from previous run.	A. If bad undercut is present, clean slag out and cover with a run from a smaller diameter electrode.
		B. Joint preparation too restricted.	B. Allow for adequate penetration and room for cleaning out the slag.
		C. Irregular deposits allow slag to be trapped.	C. If very bad, chip or grind out irregularities.
		D. Lack of penetration with slag trapped beneath weld bead.	D. Use smaller electrode with sufficient current to give adequate penetration. Use suitable tools to remove all slag from corners.
		E. Rust or mill scale is preventing full fusion.	E. Clean joint before welding.
		F. Wrong electrode for position in which welding is done.	F. Use electrodes designed for position in which welding is done, otherwise proper control of slag is difficult.

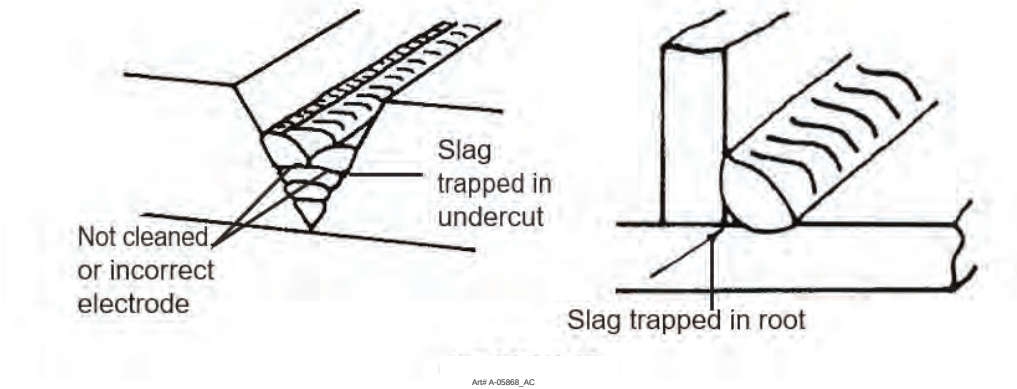
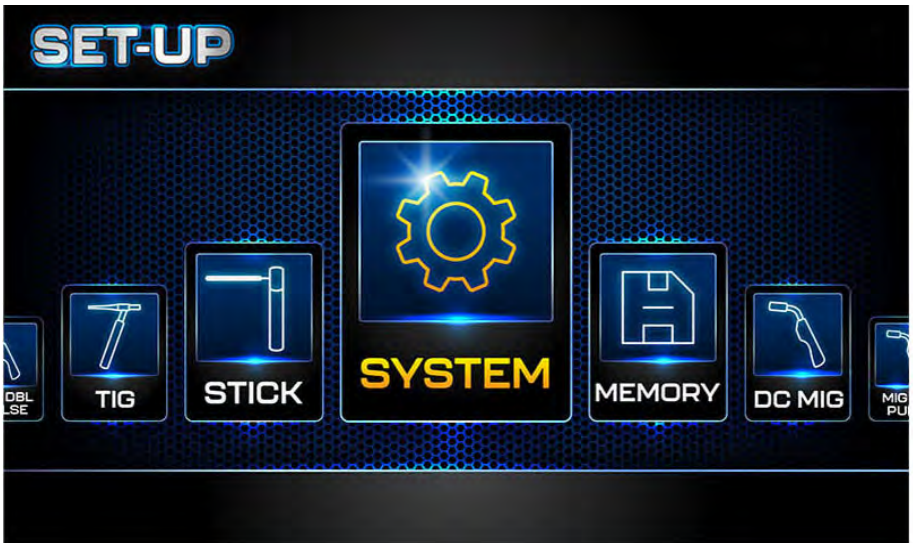


Figure 7-14: Examples of Slag Inclusion

Table 7-2: Welding Issues - Cause & Remedy

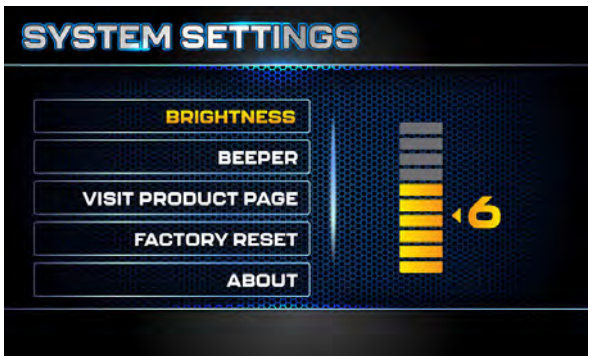
SECTION 8: ROUTINE SERVICE REQUIREMENTS AND POWER SOURCE PROBLEMS

8.01 SYSTEM SETTINGS



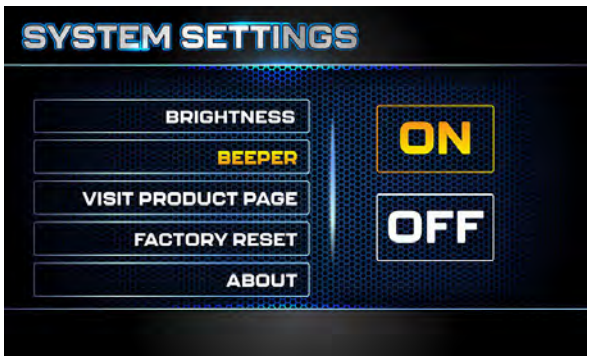
BRIGHTNESS

This function adjusts the brightness of the display screen.



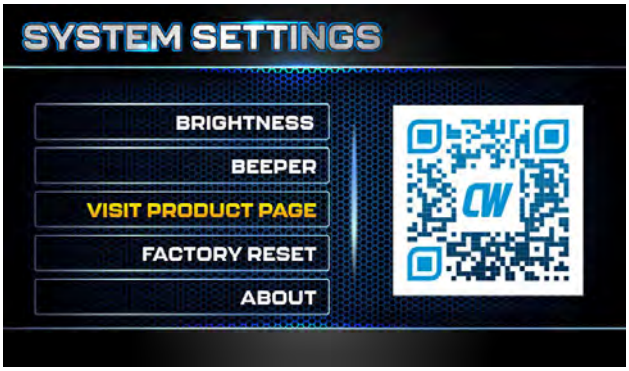
BEEPER

This function turns On or OFF the Beeper when pressing buttons or rotating the control knobs.

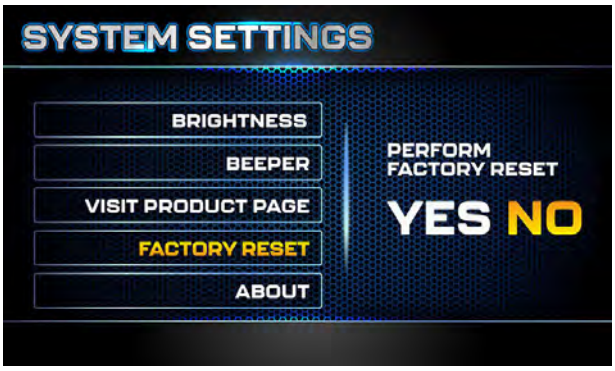


VISIT PRODUCT CARE

This function shows the QR code to download the operating manual and spare parts.



FACTORY RESET



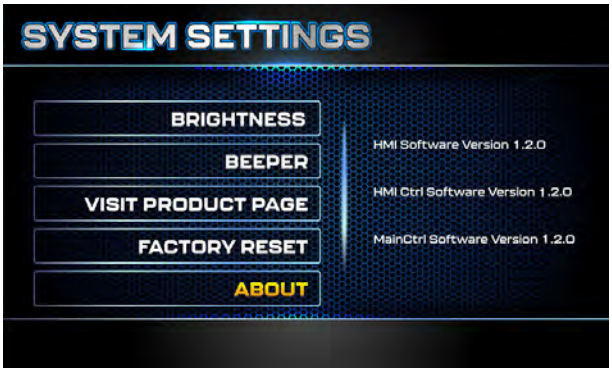
The BlueVenom XF210⁶ can have Factory Default Settings restored.

To reset to factory settings, while in the Home Screen, rotate the Right Hand Control Knob until reaching the System Icon, then depress the control knob to select.

Once in System Settings, rotate the Left Hand Control Knob to the Factory Reset Icon. Using the Right Hand Control Knob, rotate until YES is highlighted yellow.

Long press the Right Hand Control Knob to perform the Factory Reset. Once reset, the screen will change to the DC MIG Autoset weld screen.

ABOUT



This function shows the the software version of the welder.

8.02 A ROUTINE MAINTENANCE & INSPECTION

ELECTRICAL WARNING

There are extremely dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson. Disconnect the Welding Power Source from the Mains Supply Voltage before disassembling.

This function shows the the software version of the welder.

Welding equipment should be regularly checked by a qualified electrical tradesperson to ensure that:

- The main earth wire of the electrical installation is intact.
- Power point for the Welding Power Source is effectively earthed and of adequate current rating.
- Plugs and cord extension sockets are correctly wired.
- Flexible cord is of the 3-core tough rubber or plastic sheathed type of adequate rating, correctly connected and in good condition.
- Welding terminals are shrouded to prevent inadvertent contact or short circuit.
- The frame of the Welding Power Source is effectively earthed.
- Welding leads and electrode holder are in good condition.
- The Welding Power Source is clean internally, especially from metal filing, slag, and loose material. If any parts are damaged for any reason, replacement is recommended.

8.03 CLEANING THE WELDING POWER SOURCE

To clean the Welding Power Source, open the enclosure and use a vacuum cleaner to remove any accumulated dirt, metal filings, slag and loose material. Keep surfaces clean as accumulated foreign material may reduce the welders output welding current.

CAUTION

Do not use compressed air to clean the Welding Power Source. Compressed air can force metal particles to lodge between live electrical parts and earthed metal parts within the Welding Power Source. This may result in arcing between this parts and their eventual failure.

8.04 CLEANING THE FEED ROLLS

Clean the grooves in the feed rolls frequently. This can be done by using a small wire brush. Also wipe off or clean the grooves on the upper feed roll. After cleaning, tighten the feed roll retaining knobs.

8.05 BASIC TROUBLESHOOTING

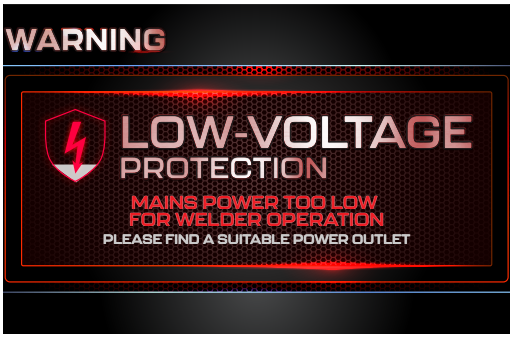
ELECTRICAL WARNING

There are extremely dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson and you have had training in power measurements and troubleshooting techniques.

If major complex subassemblies are faulty, then the Welding Power Source must be returned to an Accredited CIGWELD Service Provider for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge.

8.06 BLUEVENOM XF210⁶ WARNING SCREENS

WARNING SCREEN	CAUSE	REMEDY	
OVER TEMPERATURE 	Over Temperature	**A** **B** **C**	Duty cycle of the Power Source has been exceeded. Leave the power source switched ON with the fan running and allow it to cool. Check front and rear Panel Air Louvres are clean and not blocked by any dirt or obstacles. If damaged they should be replaced by an Accredited CIGWELD Service Provider. Check that the fan is running normally during welding. If the fan is not running during welding it may be faulty and need replacing. Contact an Accredited CIGWELD Service Provider. Note this unit has Fan on Demand fitted. Refer to Section 4 for further details.
OVER CURRENT  Figure 8-2: Over Current	Over Current	**A** **B** **C**	Power Source has exceeded its Current (Amps) Output Limit. Leave the Power Source turned ON. The machine will resume automatically after 8 seconds and the Over Current Warning will disappear from the screen. Set the output current according to the Rating Label located on bottom panel of the Power Source. If Warning Screen is still present contact an accredited CIGWELD Service Provider.
OVER POWER  Figure 8-3: Over Power	Over Power	**A**	Input Power Supply is outside the parameters of the Machine. Contact Qualified Electrician to Check Input supply.
LOW VOLTAGE  Figure 8-4: Low Voltage	Low Voltage	**A**	Input Power Supply is outside the parameters of the Machine. Contact Qualified Electrician to Check Input supply.

SECTION 9:
MIG GUN AND TIG TORCH CONSUMABLES

9.01 MIG GUN BZ24 EURO CONSUMABLES

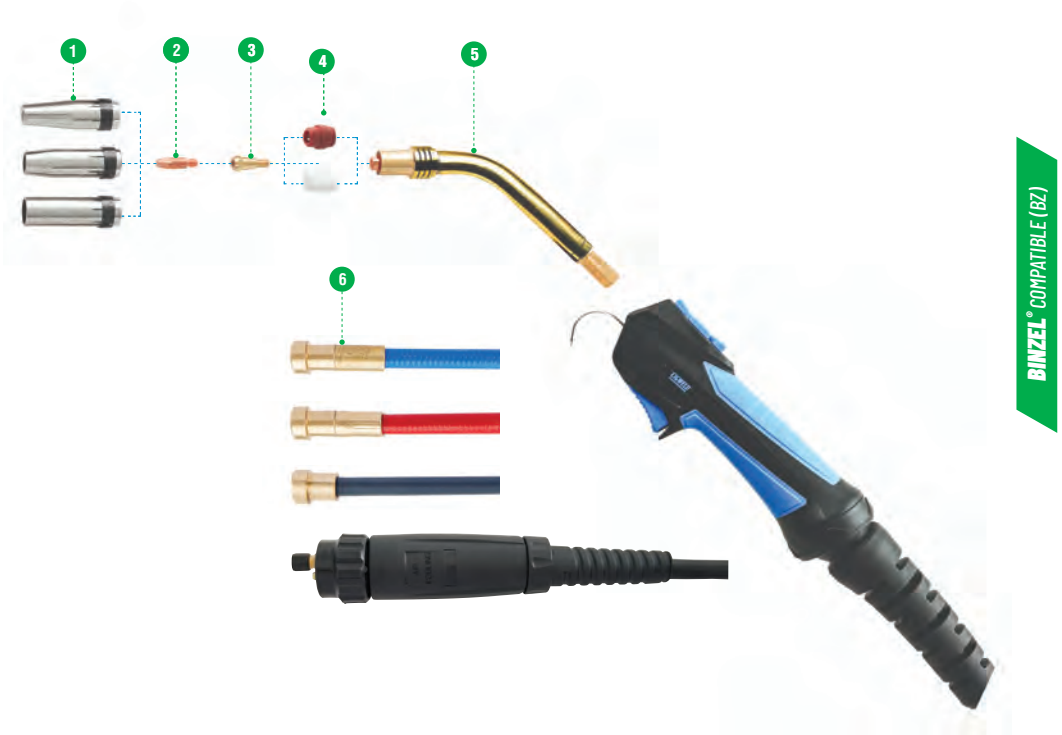


Figure 9-1:MIG GUN BZ24 EURO Consumable Parts

MIG GUN BZ24 EURO CONSUMABLE PARTS

ITEM	PART NUMBER	DESCRIPTION
1	BZN2410	Nozzle Tapered, 10mm, Pack of 2
	BZN2413	Nozzle Conical, 13mm, Pack of 2
	BZN2417	Nozzle Cylindrical, 17mm, Pack of 2
2	BZT6806	Contact Tip 0.6mm M6 L:28mm, Pack of 10
	BZT6808	Contact Tip 0.8mm M6 L:28mm, Pack of 10
	BZT6809	Contact Tip 0.9mm M6 L:28mm, Pack of 10
	BZT6810	Contact Tip 1.0mm M6 L:28mm, (Suitable for 0.9mm AL Wires), Pack of 10
	BZT6812	Contact Tip 1.2mm M6 L:28mm, (Suitable for 1.0mm AL Wires), Pack of 10
	BZT6814	Contact Tip 1.4mm M6 L:28mm, (Suitable for 1.2mm AL Wires), Pack of 10
3	BZH24M6	Tip Holder M6, Pack of 2
4	BZD24S	Diffuser Silicone
	BZD24	Diffuser Standard
5	W4023009	Neck Gun CW BZ24 Disp/4B
6	CML5K0609	Multi Liner Kit Steel 0.6-0.9mm, 5.1m
	CML5K0912	Multi Liner Kit Steel 0.9-1.2mm, 5.1m
	CML5K0916A	Multi Liner Kit Aluminium 0.9-1.6mm, 4.5m
	CML50609	Multi Liner Steel 0.6-0.9mm, 5.1m, (No Collet)
	CML50912	Multi Liner Steel 0.9-1.2mm, 5.1m, (No Collet)
	CML50916A	Multi Liner Aluminium 0.9-1.6mm, 4.5m, (No Collet)
	CMLCBZ	Multi Liner Collet suit Binzel

Table 9-1: MIG GUN BZ24 EURO CONSUMABLES

9.02 TIG TORCH CONSUMABLES

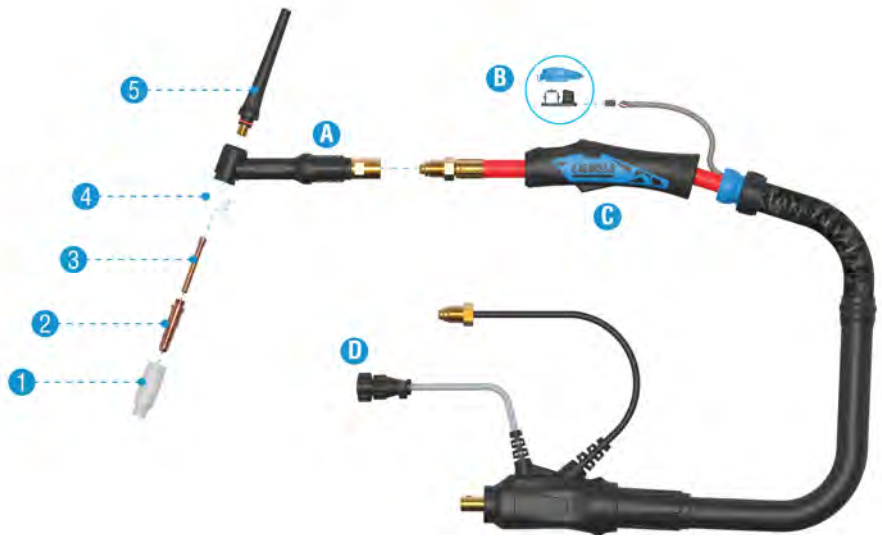


Figure 9-2:TIG Standard Consumables Parts

17/18/26 TIG TORCH CONSUMABLES - STANDARD		
ITEM	PART NUMBER	DESCRIPTION
1	CW10N50	Ceramic Cup 6mm #4
	CW10N49	Ceramic Cup 8mm #5
	CW10N48	Ceramic Cup 10mm #6
	CW10N47	Ceramic Cup 11mm #7
	CW10N46	Ceramic Cup 13mm #8
	CW10N45	Ceramic Cup 16mm #10
	CW10N44	Ceramic Cup 19mm #12
2	CW10N31	Collet Body - Standard 1.6mm
	CW10N32	Collet Body - Standard 2.4mm
	CW10N28	Collet Body - Standard 3.2mm
3	CW10N23	Collet - Standard 1.6mm
	CW10N24	Collet - Standard 2.4mm
	CW10N25	Collet - Standard 3.2mm
4	CW18CG	Insulator
5	CW57Y02	Back Cap Long
	CW57Y05	Back Cap Medium
	CW57Y04	Back Cap Short
A	W4023028	Torch Body - Dimex Elite 26
	W4023029	Torch Body - Dimex Elite 26F (Flexible)
B	W4023014	TIG Module - Trigger and Potentiometer
C	W4023032	Dimex Elite Handle - 18/26
D	W4023018	8 PIN Connector

Table 9-2: TIG Torch Consumables - Standard

CIGWELD
AN ESAB BRAND

LIMITED WARRANTY TERMS

LIMITED WARRANTY: CIGWELD Pty Ltd, An ESAB Brand, hereafter, "CIGWELD" warrants to customers of its Authorised distributors hereafter "Purchaser" that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the CIGWELD products as stated below, CIGWELD shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with CIGWELD's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at CIGWELD's sole option, of any components or parts of the product determined by CIGWELD to be defective.

CIGWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: CIGWELD SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SUCH AS, BUT NOT LIMITED TO, LOST PROFITS AND BUSINESS INTERRUPTION.

The remedies of the Purchaser set forth herein are exclusive and the liability of CIGWELD with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by CIGWELD whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of CIGWELD is Authorised to change this warranty in any way or grant any other warranty.

PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN CIGWELD'S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY CIGWELD PRODUCT. PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-Authorised PERSONS.

*WARRANTY SCHEDULE

WARRANTY	WARRANTY PERIOD (PARTS AND LABOUR)
BlueVenom XF210⁶ Power Source	3 Years
ACCESSORIES	**WARRANTY PERIOD**
TIG torch, electrode holder lead and work lead	3 Months
TIG torch consumable items	NIL
Gas Regulator/ Flowmeter (excluding seat assembly, pressure gauges, elastomer seals and “O” rings	1 Year
Regulator seat assemblies and pressure gauges	6 Months
Elastomer seals and “O” rings used in the equipment	3 Months

CIGWELD LIMITED WARRANTY DOES NOT APPLY TO:

- Obsolete goods sold at auction, second-hand goods and prototype goods.
- Consumable Parts for TIG, MIG, Plasma welding, Plasma cutting and Oxy fuel torches, O-rings, fuses, filters or other parts that fail due to normal wear.

NOTES:

* No employee, agent, or representative of CIGWELD is Authorised to change this warranty in any way or grant any other warranty, and CIGWELD shall not be bound by any such attempt. Correction of non-conformities, in the manner and time provided herein, constitutes fulfilment of CIGWELD’s obligations to purchaser with respect to the product.
* This warranty is void, and seller bears no liability hereunder, if purchaser used replacement parts or accessories which, in CIGWELD’s sole judgment, impaired the safety or performance of any CIGWELD product and if the unit is altered or serviced by an unauthorised CIGWELD Service Provider. Purchaser’s rights under this warranty are void if the product is sold to purchaser by unAuthorised persons.

SECTION 10: NOTES

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